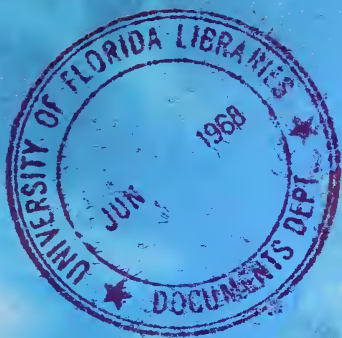



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# AIR UNITED STATES FORCE ACADEMY



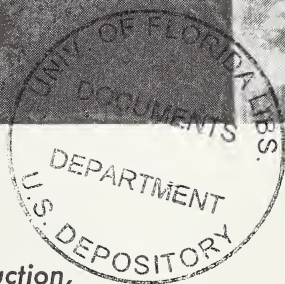
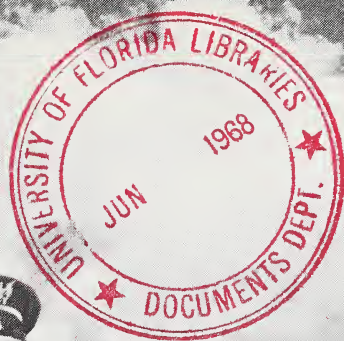
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# ANNUAL CATALOG



## MISSION

*The Air Force Academy provides instruction,  
experience, and motivation to each cadet  
so that he will graduate with the knowledge,  
character, and qualities of leadership  
essential to his progressive development  
as a career officer in the United States Air Force.*

**number 13**

•

**april 1968**







*The Air Force Academy is a service institution with the special mission of producing Air Force career officers. Young men chosen to attend the Academy receive their education free and have personal expenses paid by the federal government. Therefore, scholarships and financial assistance programs are not required or permitted for Academy cadets.*



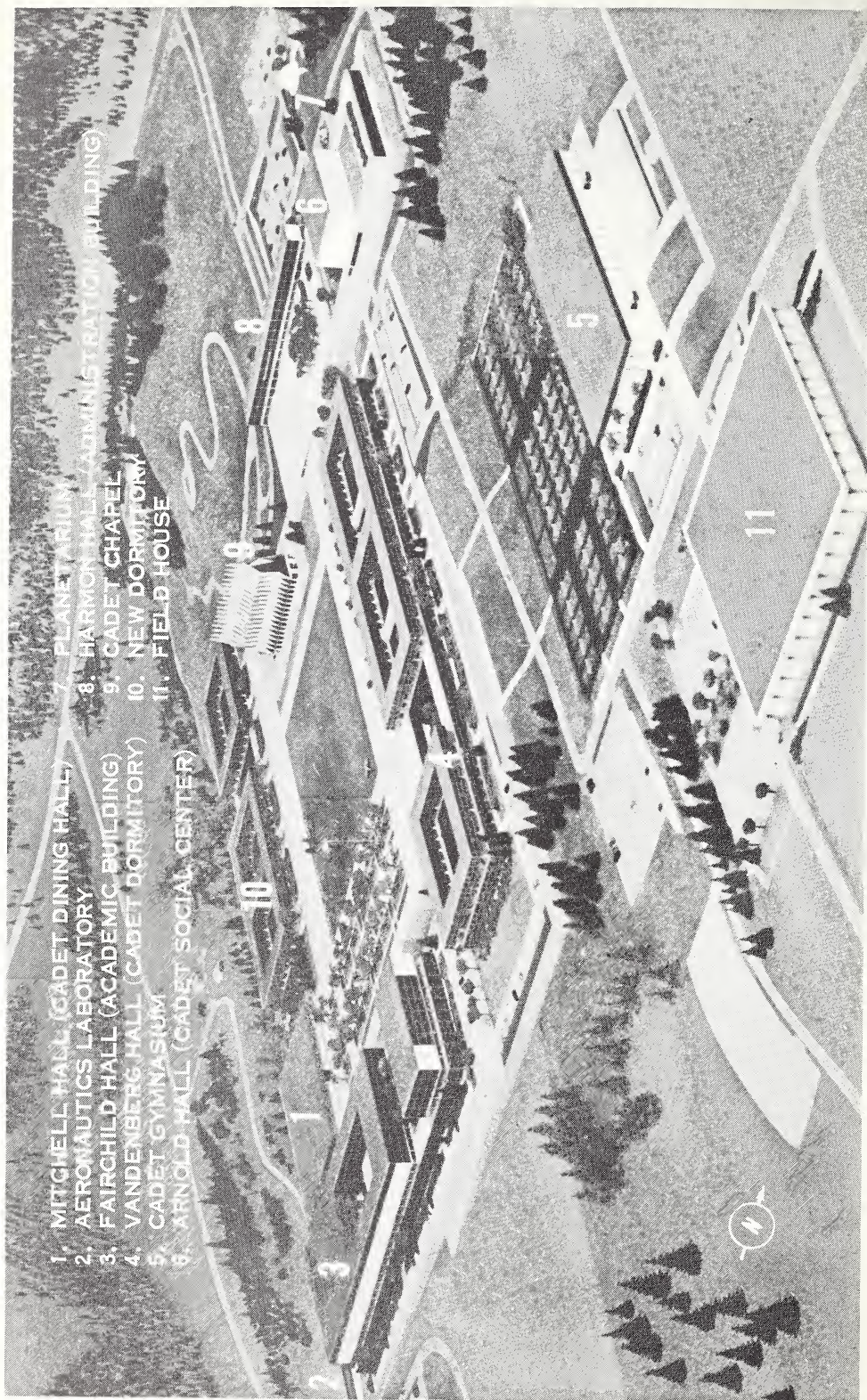
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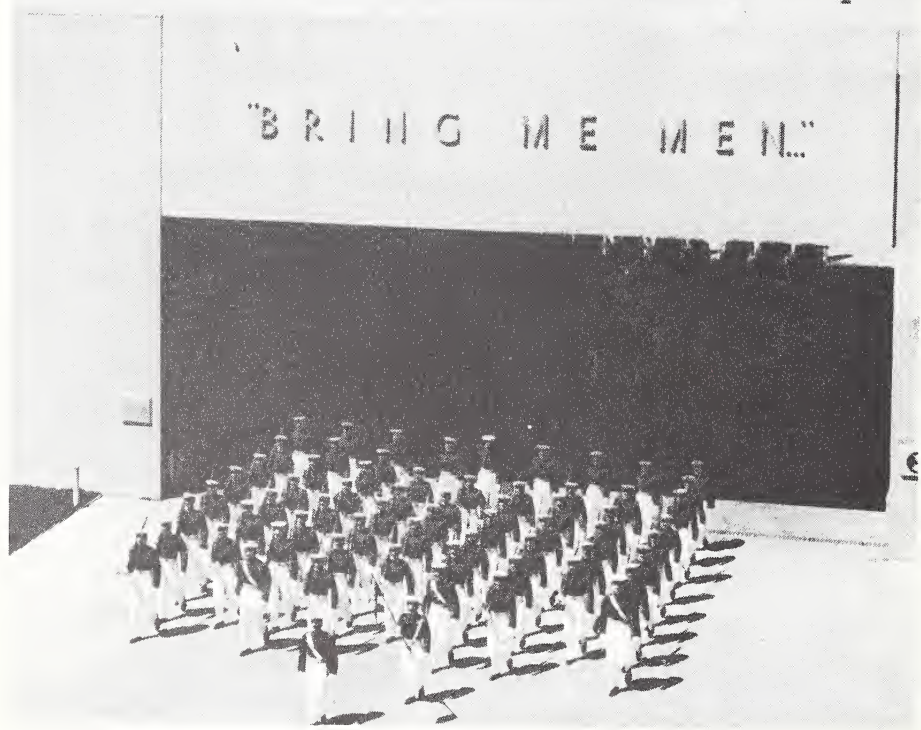
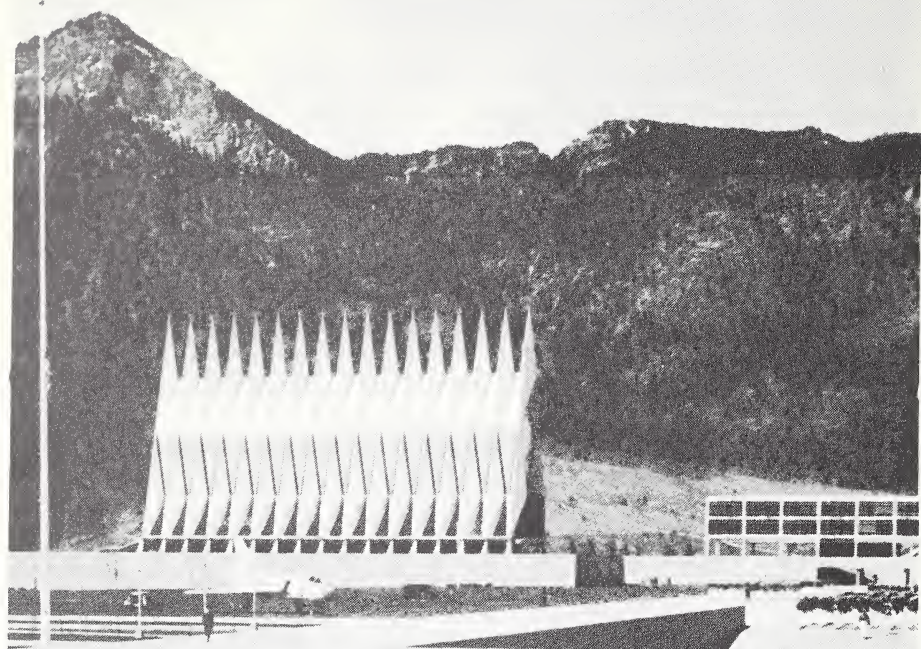
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# Calendar 1968-1969

5	Wednesday	Jun 68	Summer Term Begins
24	Monday	Jun 68	Class of 1972 Enters
19	Monday	Aug 68	Summer Term Ends; Fall Semester Begins
2	Monday	Sep 68	Holiday, Labor Day
27	Wednesday	Nov 68	Thanksgiving Holidays
1	thru Sunday	Dec 68	
20	Friday	Dec 68	Fall Semester Ends; Christmas Leave Begins
3	Friday	Jan 69	Christmas Leave Ends
6	Monday	Jan 69	Spring Semester and Winter Term Begin
27	Monday	Jan 69	Winter Term Ends
22	Saturday	Feb 69	Holiday, George Washing- ton's Birthday
21	Friday	Mar 69	Mid-Semester Holiday
30	thru Sunday		
28	Wednesday	May 69	Spring Semester Ends
30	Friday	May 69	Holiday, Memorial Day
31	Saturday	May 69	June Week
4	thru Wednesday	Jun 69	
4	Wednesday	Jun 69	Graduation, Class of 1969; Summer Term Begins
23	Monday	Jun 69	Class of 1973 Enters



"Bring me men to match my mountains  
 Bring me men to match my plains  
 Men with empires in their purpose  
 And new eras in their brains."



**TO: Young men interested in  
the Air Force Academy**



A poem by Sam Walter Foss begins with a stanza entitled "Bring Me Men" which characterizes the type of outstanding young men sought by the Air Force Academy.

A young man who is admitted to the Academy commits himself to a life of high moral standards and service to his country. He has contracted to serve four years as a cadet, and after graduating from the Academy to serve at least five years as an officer in the United States Air Force.

Because of the serious purpose of accepting a cadet appointment, each candidate should give careful consideration to the reasons he desires to enter the Academy. Those young men who enter for a free education with no real desire to pursue an Air Force career may find the demands of the Academy excessive. Those who enter to please their parents or friends often fail because of a lack of self-motivation. Those who are primarily interested in a profession such as law or medicine cannot be assured of achieving their career objectives through an Academy education.

The first year at the Academy is the hardest and requires a difficult adjustment for some young men. The summer training period and the introduction to college-level academics test each individual's ability to adjust. The demands for discipline, study and physical endurance are high.

All young men who become cadets have my best wishes for success at the Academy and a rewarding future in the United States Air Force.

Handwritten signature of Thomas S. Moorman.

THOMAS S. MOORMAN  
LIEUTENANT GENERAL, USAF  
Superintendent

## OBJECTIVES

The Air Force Academy accomplishes its mission through a four-year curriculum composed of academic courses, leadership and military training, physical education and athletics. Completion of the curriculum entitles the cadet to graduate with a Bachelor of Science degree and a Regular commission as a second lieutenant.

Inherent in the mission are the following broad objectives:

- To provide each cadet with a general education leading to the award of a baccalaureate degree and an opportunity to advance academically as far and as fast as his ability and prior preparation permit.
- To provide each cadet with a broad military education as a foundation for his progressive development as a professional officer.
- To provide the necessary leadership training opportunities for the cadet to develop his capabilities and skills as a leader.
- To develop in each cadet the ideals of duty, honor, and service to his country.
- To develop in each cadet the physical attributes and skills necessary to meet the requirements of cadet and commissioned life.

Achievement of these objectives is the responsibility of the Academy Superintendent and his staff. The Superintendent is directly responsible to the Chief of Staff, United States Air Force, for the operation of the Academy. Key officers of administration under the Superintendent are: the Dean of the Faculty who implements the academic program and supervises the faculty; the Commandant of Cadets who executes the leadership and military training program and is responsible for the Cadet Wing; the Director of Athletics who carries out the physical education and intercollegiate athletic programs; and the Registrar who supervises programs of candidate information and cadet admissions, records, and counseling.

The Academy Board, composed of the key staff and other officers primarily responsible for cadet instruction, is the principal advisory body to the Superintendent on Academy educational and training policies.

A Board of Visitors, composed of Members of Congress as designated by public law, visits the Academy each year to investigate cadet morale and discipline, the curriculum and instruction, facilities and financial matters.



## OFFICERS OF ADMINISTRATION

### **Superintendent**

LT. GEN. THOMAS S. MOORMAN

B.S., United States Military Academy; M.S., California Institute of Technology

### **Dean of the Faculty**

BRIG. GEN. ROBERT F. McDERMOTT

B.S., United States Military Academy; M.B.A., Harvard University;  
LL.D., St. Louis University; Litt.D., Saint Bernard College

### **Commandant of Cadets**

BRIG. GEN. ROBIN OLDS

B.S., United States Military Academy

### **Director of Athletics**

COL. FRANCIS E. MERRITT

B.S., United States Military Academy; M.A., George Washington University

### **Chief of Staff**

COL. RALPH C. EMBREY

B.B.A., University of Oklahoma; M.B.A., George Washington University

### **Acting Registrar**

COL. WILLIAM R. JARRELL, JR.

B.S., United States Military Academy; M.A., George Washington University

## ACADEMY STAFF

COL. LEE C. BLACK, *Commander, Air Force Academy Preparatory School* — B.A., University of Utah; M.A., University of Pittsburgh

COL. HARRY C. GREEN, JR., *Command Surgeon* — M.D., University of Louisville

COL. MARCOS E. KINEVAN, *Staff Judge Advocate* — B.S., United States Military Academy; J.D., University of California at Berkeley

COL. ROY M. TERRY, *Command Chaplain* — B.S., Syracuse University; B.D., Yale University Divinity School; LL.D., Atlanta Law College

COL. GLENN R. ALEXANDER, *Deputy Chief of Staff/Operations and Plans* — B.G.E., University of Omaha

COL. CARL O. BRASIER, *Deputy Chief of Staff/Engineering* — B.S., University of Oklahoma

COL. JOHN E. HORNE, *Deputy Chief of Staff/Personnel* — B.A., St. Olaf College

COL. JACK M. MCGREGOR, *Deputy Chief of Staff/Comptroller* — B.S., M.S., University of Alabama

COL. JACK K. SEWELL, *Deputy Chief of Staff/Materiel* — B.S., North Texas State University; M.S., George Washington University

COL. BRICE E. MACARTNEY, *Special Assistant to the Chief of Staff* — University of Maryland

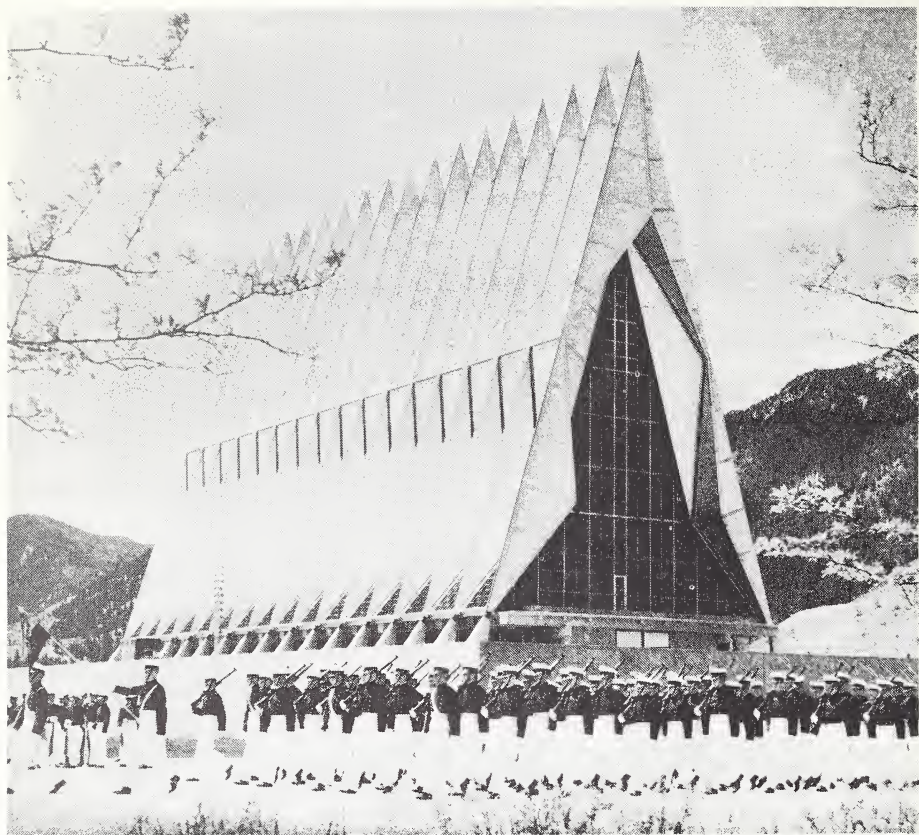
LT. COL. THOMAS F. BULLOCK, *Executive Officer* — B.S., United States Military Academy; M.B.A., George Washington University

LT. COL. ROBERT V. CRANDALL, *Director of Administrative Services* — University of Southern California

LT. COL. GORDON P. CULVER, *Director of Protocol* — Dickinson State College, N.D.

LT. COL. LAWRENCE J. TACKER, *Director of Information* — Sacramento State College

LT. COL. ORRIN G. ZEBARTH, *Director of Inspection* — B.S., Southern Colorado State College



## HISTORY

The idea of an Air Force Academy was in the process of development for more than a third of a century. The evolution of American military aviation during World War I indicated the growing importance of airpower to national defense. The decisiveness of aerial warfare in World War II clearly demonstrated the future dominant role of airpower in defense of the free world.

Following the war, the Air Force became a separate branch of service and began to make proposals to establish an air academy along the lines of West Point and Annapolis. The Military Academy had been educating professional officers since 1802 and the Naval Academy since 1845. Now that air and space technology



was in full development, the Air Force also needed an institution to prepare a nucleus of career officers dedicated to aerospace purposes and imbued with traits of character and leadership.

Proposals for the new academy were interrupted by the Korean war. At the close of this conflict, Congress authorized establishment of the Air Force Academy and President Eisenhower signed the legislation on 1 April 1954.

Plans for building the Air Force Academy began immediately. A site selection committee, composed of prominent civilian and military leaders, screened some 400 locations and visited proposed sites in 22 states. On 24 June 1954, the Secretary of the Air Force announced that the site eight miles north of Colorado Springs would be the permanent home of the Air Force Academy.

The Academy was established at a temporary location on Lowry Air Force Base in Denver until construction was completed at the permanent site. On 11 July 1955, in ceremonies at Lowry, the first class of 306 cadets was sworn in and the new service academy was dedicated.

Lt. General Hubert R. Harmon, who had been a member of the site selection committee, was appointed by the President as the first Superintendent of the Air Force Academy. Under his direction a program of education, with the versatility to meet rapidly changing development of the aerospace age, was carefully designed and perfected. The basic fundamentals and the newest findings of science were blended with the social sciences and the humanities to form a balanced program of education for future Air Force officers.

While a curriculum, a tradition, and a cadet way of life were being formed at Lowry, one of the greatest community building projects in the nation's history went into operation at the permanent site some sixty miles away. Moving at a fast pace on this prodigious project, the Academy builders had the cadet buildings ready for occupancy by the time the first cadet class reached its final year. On 29 August 1958, the cadets began to move into their new quarters located in the Rampart Range of the Rocky Mountains.

In 1962 the Cadet Wing reached its authorized strength of approximately 2,500 cadets. In 1964 Congress passed a law authorizing an annual increase in the size of entering cadet classes until a maximum of 4,417 cadets is reached. This legislation equalizes student strength at the Air Force, Army and Naval academies.



## FACILITIES

The Academy site encompasses 18,000 acres of former ranch land, divided into five mesas with valleys in between. This expanse of land has allowed for construction of an airfield, if approved by Congress, and for further plant expansion to accommodate additional students as needed by the Air Force.

Dominating the western side of the reservation are the majestic mountains with renowned Pikes Peak in the distance. The site adjoins the sweeping plains to the east. On all sides are spectacular scenes of nature to frame the modern campus. Situated at 7,200 feet altitude, the elevated campus seems remarkably appropriate as the location to educate future leaders for space technology and exploration. The site already seems high in the sky, not too far from the vast reaches of outer space.

The cadet area, which is the main complex of the Academy, is constructed on the mesa or ridge at the north end of the site. The buildings are designed in contemporary architectural style featuring glass, aluminum, steel and white marble. Most of the buildings have been named for famous Air Force leaders.

Vandenberg Hall, a cadet dormitory, has 1,320 rooms, squadron areas, hobby shops, and a cadet store. Mitchell Hall, a large



dining hall surrounded by picture windows, accommodates all the cadets for meals.

Classes are held in Fairchild Hall, the academic building, containing classrooms, laboratories, lecture halls and faculty offices as well as a cadet library and dispensary. An Aeronautics Laboratory contains extensive equipment to prepare cadets for America's diversified man-in-space programs. Included among the facilities are trisonic and subsonic wind tunnels, engine test cells, a solid rocket installation and shock tube. Cadets participate in athletics at the Cadet Gymnasium, which has two swimming pools and facilities for a variety of sports. Social functions are held in Arnold Hall, the cadet social center, including a ballroom, theater, recreation rooms and a snack bar.

Religious services are conducted in the Cadet Chapel, a building unique and striking in its design, with 17 towering spires emitting light to the Protestant nave through colorful stained glass. Catholic and Jewish naves and a meeting room for members of other faiths are located on the lower floor level.

To accommodate the larger cadet classes authorized by legislation, the Academy is building another dormitory and expanding classrooms and several other cadet facilities. In addition, a field house has been constructed to provide indoor facilities for the practice of varsity and intramural sports, an indoor competitive track, an ice hockey rink, and a general cadet assembly area.

The Academy Superintendent and his staff are located in Harmon Hall, the administration building. Behind this building is a Court of Honor where tourists are permitted to view the cadet area and to witness the noon formations of the Cadet Wing. In front of Harmon Hall is the Planetarium utilized for cadet classes as well as demonstrations open to the public.

Located in areas south of the cadet complex are two housing developments for officers and airmen, a shopping center, a hospital, the Academy Preparatory School, and a supply and service center. A 40,000-seat football stadium, an 18-hole golf course, and a recreation area in the mountains have been constructed with private funds donated through the Air Force Academy Foundation.

The Air Force Academy has become Colorado's number one tourist attraction. Last year over one million people visited the site. The public is invited to tour the Academy at any time. A brochure with a map is given to every visiting car at the entering gate to assist the tourists in locating areas of interest.

# Admissions

## AUTHORIZED STRENGTH of the AIR FORCE ACADEMY CADET WING

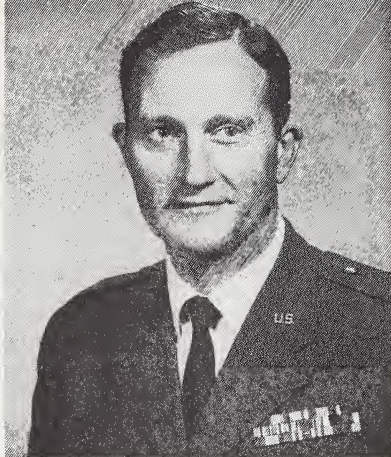
Congressional legislation enacted in 1964 provides for an increase in authorized strength from 2,529 to 4,417 cadets. The class input will increase gradually until maximum strength is reached. The authorized appointments at maximum strength for each nominating category are shown below. Cumulative appointments are the total number available, of which approximately one-fourth will enter each year. The other appointments are filled annually.

<b>SOURCE OF NOMINATION</b>	<b>Authorized Appointments (Cumulative)</b>
100 United States Senators (5 each)	500
435 United States Representatives (5 each)	2,175
Vice-President	5
District of Columbia	5
Puerto Rico	6
Canal Zone	1
American Samoa, Guam, Virgin Islands	1
Sons of Deceased or Disabled Veterans	40
<b>Allied Students</b>	
Republic of the Philippines	4
American Republics	20
	<b>(Annual)</b>
Presidential	100
Regular Components	85
Reserve Components	85
Honor Military and Naval Schools and AFROTC	20
Qualified Alternates	150
Sons of Medal of Honor Winners	No Limit



**Col. William R. Jarrell, Jr.**  
**Acting Registrar**

B.S., United States Military Academy  
M.A., George Washington University



COL. CHARLES C. ANDERSON, JR., *Deputy Registrar* — B.A., M.A., Sacramento State College

**CANDIDATE ADVISORY SERVICE**

LT. COL. ROSS C. ALM, *Director of Candidate Advisory Service* — B.A., University of North Dakota; M.A., Michigan State University; Ph.D., University of Denver

MAJ. BILLY W. BAKER, *Assistant Director* — B.S., Austin Peay State College; M.A., Michigan State University

MAJ. JOHN W. BLANTON, *Assistant Director* — B.S., Tennessee State University

MAJ. ROBERT J. PEARY, *Assistant Director* — B.A., University of Pittsburgh

CAPT. ELLIOT L. JOHNSON, *Assistant Director* — B.S., San Diego State College

**ADMISSIONS**

LT. COL. ARTHUR S. KNIES, *Director of Admissions* — B.S.B.A., M.Ed., Rutgers University

RICHARD O. FISCHER, *Assistant Director of Admissions* — B.S., University of Nebraska; M.A., University of Iowa

**CADET RECORDS**

LT. COL. NAOMI McCracken, *Director of Cadet Records* — B.A., New Mexico Highlands University; M.A., University of Kentucky

**EVALUATION**

RISDON J. WESTEN, *Director of Evaluation* — B.S., University of Illinois

GEORGE V. PORTER, JR., *Chief of Examinations Division* — B.S., University of Nebraska; M.A., Columbia University

CAPT. GEORGE H. WALTHER, *Chief of Research Division* — B.A., B.S., Louisiana State University; M.A., University of Arizona

**CADET COUNSELING**

MAJ. DAVID A. SENA, *Director of Cadet Counseling* — B.S., University of Massachusetts; Ed.M., Harvard University

CAPT. WILLIAM E. SPENCE, JR., *Assistant Director of Cadet Counseling* — B.A., Virginia Military Institute; M.Ed., Eastern Washington State College; M.S., University of North Dakota

## Assistance to Candidates

A group of Air Force Reserve officers not on active duty, who are located in communities throughout the United States, act in an official capacity as liaison officers for the Academy. It is the duty of a liaison officer to provide information to young men and their parents concerning admissions procedures and cadet life.

A prospective candidate who desires to talk with the liaison Officer nearest to him may be able to obtain his name and address from the guidance counselor at his high school. If it is not available, he may request this information by writing to the Liaison Officer Coordinator in his area. A list of coordinators is included in the Admissions Appendix of this catalog. The liaison officers are supervised by the Director of Candidate Advisory Service under the Academy Registrar.

If additional copies of the Academy Catalog are needed by school counselors, prospective candidates or their parents, copies may be obtained by writing to the Registrar, United States Air Force Academy, Colorado 80840.

## Important Dates

	1968		1969
Application and Nomination Period	1 June	through	31 January
Medical and Physical Examinations	December	through	March
College Board Tests (regular dates)	2 November		11 January
	7 December		1 March
College Board Tests (make-up date)			15 March
Cadet Class Selected			20 April to 23 June
Cadet Class Enters			23 June

## Definition of Terms

*Applicant* — One who makes application to a Member of Congress or other nominating authority requesting a nomination for appointment to the Air Force Academy.

*Nominee* — An applicant who has obtained a nomination in a category authorized by law.

*Candidate* — A nominee whose name has been recorded by the Academy Director of Admissions as being qualified to compete for an appointment.

*Appointee* — A qualified candidate who has been selected for admission.

*Cadet* — An appointee who has been admitted to the Academy and taken the oath of allegiance.



## GUIDE TO APPLICANTS

1. A young man should start preparing for the Academy in high school by following the recommendations for preparation on pages 53 to 57.

2. Before applying for a nomination, he should determine whether he meets the basic eligibility requirements listed on page 18.

3. He should study the nominating categories on page 19 to 24 to determine those categories in which he is eligible to compete for appointment to the Academy. He will enhance his chances of selection by applying for a nomination in each category in which he is eligible.

4. He should write letters to the appropriate nominating authorities requesting nomination within the time schedule given under each category. His applications should be submitted approximately a year prior to his desired June admission. Sample letters of application are included in the Admissions Appendix, pages 45 to 49.

5. He should follow carefully all instructions he receives from nominating authorities. A Member of Congress may require the applicant to take preliminary examinations to aid him in screening and selecting his nominees. These examinations are explained on page 19.

6. If the applicant is successful in obtaining a nomination, and if qualified, he will become an official candidate and must follow all instructions he receives from the Director of Admissions. He will be required to take certain entrance examinations and to submit required documents and forms. Information concerning these requirements can be found on pages 25 to 31.

7. After all examinations and requirements have been met, the candidate will await notification from the Academy on the results of his competition for appointment. The method of evaluation and selection of candidates for cadet appointments is explained on page 32.

8. Selected candidates will receive instructions from the Director of Cadet Records pertaining to their travel and admission to the Academy. The general requirements of cadet appointees are given on pages 33 to 35.

## ELIGIBILITY REQUIREMENTS

To be eligible to apply for a cadet appointment to the Air Force Academy, a young man must meet the following basic requirements:

*Age* — He must be at least 17 and not have passed his 22nd birthday on 1 July of the year he is to be admitted.

*Citizenship* — He must be a citizen of the United States. (Allied students are exempt from this requirement.)

*Character* — He must be responsible, trustworthy, stable and have good moral character.

*Marital Status* — He must never have been married. Any cadet who marries will be discharged from the Academy.

*Medical Standards.* — He must be in good physical condition with none of the disqualifying defects listed on pages 37-42 of the catalog.

*Scholastic* — He must have adequate academic preparation as reflected in his school records.

*Potential Leadership* — He must have demonstrated the potential for leadership through participation in extracurricular activities.

*Motivation* — He must have a strong desire to become a cadet and pursue a military career.

## NOMINATING CATEGORIES AND METHODS

A young man must obtain a nomination in a category authorized by law before he can take the entrance examinations and be considered for a cadet appointment. He should apply for each type of nomination he is eligible to seek in order to increase his chances of being selected. *His application should be submitted during the year preceding admission according to the specific dates given under each nominating category.*

A qualified candidate who failed to receive an appointment in a previous year may become a candidate again by obtaining a new nomination from an appropriate authority, provided he still meets the Academy eligibility requirements. A previous candidate will be required to retake all entrance examinations. He will receive special instructions regarding forms to be submitted.

In requesting a nomination, the applicant should follow the instructions given on pages 19 through 24, the methods of application in each nominating category.



## Congressional

Any resident of one of the 50 states who meets the eligibility requirements may apply for a Congressional nomination. The applicant must submit his request directly to a Member of Congress representing him. United States Senators nominate from their respective states at large. Representatives in Congress nominate from their districts. A young man should apply to both of the United States Senators in his state and to the Representative of his Congressional district. If he desires to enter the Academy in June following graduation from high school, he is advised to submit his application a year or more in advance. During the spring of his junior year in high school is an appropriate time to apply. Members of Congress submit names of their nominees to the Academy any time between 1 June and 31 January for the class entering the following June. A majority of them will make their selections early in this period. A young man who waits until the fall or winter months to apply cannot be considered if the Member of Congress has already selected his nominees. A sample letter of application is shown on page 45.

Most Senators and Representatives require their applicants to take a Civil Service Designation Examination as a measure of their general knowledge of high school English and mathematics. Ordinarily the examination is given in July and November. The Academy does not require the results of this examination and is not involved with scheduling or advising prospective candidates on preparation.

Prior to choosing his nominees, a Member of Congress may authorize an Air Force medical examination for an applicant to determine his medical qualification. This examination will be considered a final Air Force Academy qualifying medical examination if it is administered between 1 July and the date of entrance to the Academy.

Each Senator and Representative is authorized to have a maximum of five cadets attending the Academy at any one time. A Member of Congress may choose among three primary methods of nominating candidates to fill a cadet vacancy.

1. *Principal/Alternate Method* — He may nominate one principal candidate and five alternate candidates listed in order of his preference. If the principal candidate meets the eligibility criteria and qualifies on the entrance examinations, he will be offered the appointment. If the principal does not meet the minimum requirements, the next designated alternate candidate who qualifies will be chosen.

2. *Competitive Method* — He may nominate six candidates and authorize the Air Force Academy to select his best qualified candidate. A composite score will be determined for each qualified candidate to include all entrance examination scores, ratings on previous academic achievement and extracurricular activities, and a rating based primarily upon the recommendations of school principals and teachers. The candidate having the highest composite score will be offered the appointment.

3. *Principal/Competitive Alternate Method* — He may nominate one principal candidate and five alternate candidates who will be considered on a competitive basis. The alternate candidate having the highest composite score will be designated the first alternate. The one with the second highest composite score will be the second alternate and so on in descending order.

An applicant who is selected for nomination will receive a notice from his Senator or Representative. The Director of Admissions will send official notification of a nominee's candidacy after the Member of Congress has submitted his nomination to the Academy. A considerable period of time may elapse between the applicant's request for nomination, the selection and notification of nominees by the Member of Congress, and the candidate notification and instructions from the Director of Admissions.

### **Other Nominating Authorities**

The same methods of nominating available to Members of Congress may be used by the following nominating authorities:

1. *Vice President* — The Vice President of the United States nominates candidates from the nation at large.

2. *District of Columbia* — Commissioners of the District of Columbia nominate from among the residents of the District.

3. *Panama Canal Zone* — The Governor of the Panama Canal Zone nominates from among the sons of civilians residing in the Canal Zone and sons of civilian personnel of the United States Government and the Panama Canal Company residing in the Republic of Panama.

4. *Commonwealth of Puerto Rico* — The Resident Commissioner nominates from among all the residents of Puerto Rico, and the Governor nominates natives of Puerto Rico.

The foregoing authorities must submit the names of their nominees to the Academy between 1 June and 31 January. Applicants should submit their request for nomination early in this period. Sample application letters on pages 45 and 46 may be used as a guide.



## Competitive Categories

Appointments in the following seven competitive categories are awarded to the best qualified candidates within each group according to order of merit.

1. *Presidential* — Vacancies allocated to the President of the United States have been reserved by him for sons of members of the armed services (Air Force, Army, Navy, Marine Corps, and Coast Guard). The son of a Regular or Reserve member of the armed forces is eligible if:

- (1) his parent is on active duty (other than for training), and has served continuously on active duty for at least eight years by the close of the nominating period, *or*
- (2) his parent was retired with pay or was granted retired or retainer pay (Sons of Reservists retired while *not* on active duty status are ineligible.); *or*
- (3) his parent died after retiring with pay or after being granted retired or retainer pay. (Sons of deceased Reservists who were retired while *not* on active duty status are ineligible.)

By law, a person eligible under the Sons of Deceased or Disabled Veterans category may *not* be a candidate under the Presidential category.

In order for an adopted son to qualify as a Presidential candidate, he must have been legally adopted before his fifteenth birthday or proceedings must have been started before that time. Proof of adoption should be submitted with the application.

To request a nomination in this category, the individual (not his parent) must submit his application to the Director of Admissions, between 1 June and 30 November, according to the sample letter on page 47. *He should not write directly to the President of the United States.*

2. *Sons of Deceased or Disabled Veterans* — The son of a deceased or disabled member of the armed forces is eligible if:

- (1) his parent was killed in action or died of wounds or injuries received or diseases contracted in active service, or died from preexisting injury or diseases aggravated by active service; *or*
- (2) his parent has a service-connected disability rated at not less than 100 percent resulting from wounds or injuries received or diseases contracted in active service, or resulting from preexisting injury or disease aggravated by active service.

To request a nomination in this category, an individual (not his parent) must submit his application to the Director of Admissions, between 1 June and 30 November, according to the sample letter on page 48.

3. *Regular Components*<sup>1</sup> — Vacancies are available for enlisted members of the Regular Air Force. Candidates must have completed one full year of active Regular service by 1 July of the year admitted to the Academy. A candidate must be an active member of the Regular component when appointed to the Academy, but his year of required service time does not have to be continuous.

4. *Reserve Components*<sup>1</sup> — Vacancies are allotted for enlisted members of the Air Force Reserve and the Air National Guard. Candidates must have completed one full year of Reserve service by 1 July of the year admitted to the Academy. A candidate must be an active member of the Reserve component when appointed the Academy, but his year of required service time does not have to be continuous.

5. *Honor Military and Naval Schools* — Vacancies are authorized for honor graduates of honor military and naval schools. The Departments of Air Force, Army and Navy determine annually which schools will be designated as honor schools. Each school may nominate three candidates from its honor graduates or prospective honor graduates to compete for the cadet vacancies. Each nomination must contain a certification by the head of the institution that the candidate was an honor graduate or is a prospective honor graduate during a year that the institution was designated an honor school. Nominations must be submitted on the forms provided by the Academy to the Director of Admissions between 1 June and 31 January.

6. *Air Force Reserve Officer Training Corps* — One student from each college or university AFROTC unit may be nominated to compete for the authorized vacancies. A student should apply to the Professor of Aerospace Studies who must certify that he meets the basic eligibility requirements. The Professor of Aerospace Studies will recommend to the President of the institution the best qualified applicant. The President of the institution will submit the nomination on a form provided by the Academy, indi-

<sup>1</sup>AFR 53-10, "Appointment to the United States Air Force Academy" gives complete directions for making application in the Regular and Reserve categories. A prospective candidate must apply through his unit commander, who will process his application and forward it to the Director of Admissions for a determination of eligibility. The application form (AF Form 1786) should be obtained through normal publications supply channels at the military organization where the individual is assigned. Applications for both Regular and Reserve components must be submitted between 1 March and 30 November.

cating his concurrence and the satisfactory academic standing of the nominee. The form will be sent to the Director of Admissions between 1 June and 31 January.

7. *American Samoa, Guam, and the Virgin Islands* — The Governors of American Samoa, Guam, and the Virgin Islands may each nominate four candidates. These twelve candidates will be considered on a competitive basis for one appointment when the vacancy exists. The names of all nominees must be submitted to the Director of Admissions between 1 June and 31 January for the class entering the following June. The sample letter for a Congressional application also will apply to these authorities.

### **Sons of Congressional Medal of Honor Winners**

The son of a Congressional Medal of Honor winner who served in any branch of the armed services may apply for a nomination in this category. If an applicant meets the eligibility criteria and qualifies on the entrance examinations, he will be admitted to the Academy. Vacancies are not limited in this category. An applicant must write to the Director of Admissions between 1 June and 31 January, using the sample letter on page 49 as a guide.

### **Qualified Alternate Candidates**

The Air Force Academy Board may recommend qualified alternate candidates from all categories for appointment in the number required to bring the Cadet Wing to its authorized strength. Therefore a young man nominated by a Member of Congress, but not appointed to fill his vacancy, may still be considered on a competitive basis for the Academy if he is qualified. All qualified alternate candidates will be considered and no application by the individual is necessary.

### **Allied Students**

The Air Force Academy may provide instruction to young men from allied countries as follows:

*Republic of the Philippines* — One Philippine National may be selected to receive instruction at the Academy each year. The President of the Republic of the Philippines will be responsible for selecting nominees to be considered for this appointment.

*American Republics* — As many as 20 citizens from American Republics may receive instruction at the Academy at one time. Not more than three persons from any one country may be enrolled at the same time.



*Friendly Nations* — A combined total of four students from countries who qualify under Public Law 89-802 may be enrolled.

Nominations are accepted from 1 June through 31 December for the class entering the following June, but they should be submitted as early in the period as possible. Applicants should write to their governments, not to the Academy or other United States government offices. An applicant's letter should contain complete information about his background and should be submitted at least a year prior to admission in June.

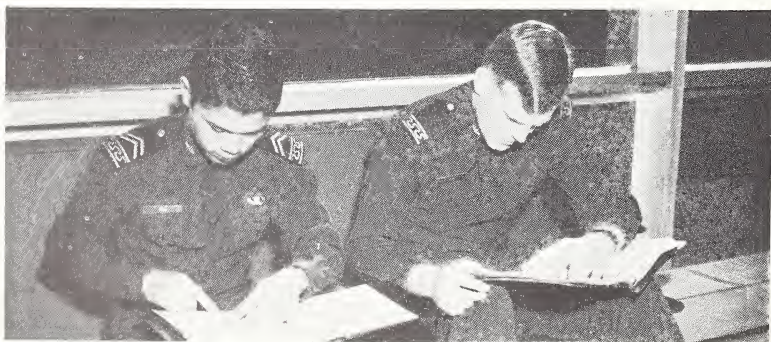
Requirements for admission are essentially the same for allied students as for United States cadets. The College Entrance Examination Board tests and the Air Force Academy qualifying medical examination are required of allied students. A nominee who does not speak English as his primary language must take the Test of English as a Foreign Language and the English Comprehension Test.

Students selected for the Academy must be able to read, write and speak English proficiently. English language instruction will be provided for them during Basic Cadet Training and the Fourth Class year. Semester schedules and curricular requirements may be adjusted by the office of the Dean of Faculty to allow for specific language and cultural differences.

Allied students receive the same pay and allowances as United States cadets. However, the allowance for initial travel to the Academy is not limited to mileage for travel within the United States.

If an allied student should be judged unable to profit by the academic courses, become deficient in conduct, or commit an offense for which a United States cadet would be dismissed, the Department of the Air Force will be requested to effect his withdrawal from the Academy.

Each student who meets the established academic requirements for allied students will be awarded a Bachelor of Science degree. If a student does not meet the degree requirements, he will be awarded a Certificate of Completion. Allied students are not commissioned in the United States Air Force.



## QUALIFYING EXAMINATIONS AND RECORDS

### Qualifying Medical Examination

The qualifying medical examination for the Air Force, Military and Naval Academies is the same although the standards differ somewhat due to the commissioning requirements of the various services. Every candidate must take the qualifying medical examination on or after 1 July of the year preceding admission. Medical examinations are conducted at Air Force, Army and Navy examining centers located throughout the United States and at designated overseas bases.

A young man is encouraged to have a preliminary medical examination by his private physician prior to pursuing a nomination and before taking the qualifying medical. The list of medical disqualification factors in the Admissions Appendix should be used as a guide. This list will serve to identify applicants who obviously are disqualified or who have physical defects which may be remedied. The applicant should have all remediable defects corrected prior to taking the qualifying medical examination. The applicant also should see his dentist for a thorough checkup. *All decayed teeth revealed visually or by x-ray must be filled to satisfy the qualifying medical requirements.*

An applicant may receive an authorization from a Member of Congress to whom he applied to take the qualifying medical examination. If he receives this authorization, he should request an examination at one of the Air Force Academy Examining Centers listed in the Admissions Appendix or at any Air Force, Army or Navy installation which has the capability to administer a service academy medical examination. His request may be made in writing. Travel and personal expenses incurred in reporting for the examination are the responsibility of the applicant.

A candidate who does not have a qualifying medical on record since 1 July will be required to take examination at an Air Force Academy Examining Center. He will be scheduled to take the physical aptitude examination at the same time. The Director of Admissions will send an authorization letter to the candidate specifying the date and center to report for these examinations. It is important that the candidate report on this date since the number of candidates scheduled at an examining center is on a quota basis. Rescheduling will be permitted only due to illness or exceptional circumstances. If rescheduling is necessary, the candidate should contact the Director of Admissions as soon as possible and specify his first and second choices of later testing dates. He

will be notified by the examining center concerning the time and place to report.

In the United States, qualifying medical and physical aptitude examinations will be scheduled as follows:

2 December 1968	20 January 1969	10 February 1969	3 March 1969
9 December 1968	27 January 1969	17 February 1969	10 March 1969
13 January 1969	3 February 1969	24 February 1969	17 March 1969

Testing overseas will be scheduled as follows:

9 December 1968	3 March 1969
13 January 1969	17 March 1969

Ordinarily a candidate will be scheduled to report to the examining center nearest to his home. Travel expenses to the center must be paid by the candidate, unless he is a member of the armed services on active duty. Meals and living accommodations while at the center will be provided at a nominal cost to the candidate. Approximately two days are required to complete the examinations.

It is recommended that a candidate either arrange for another person to drive him to the examining center or be prepared to remain there until he can drive safely. The eye examination may preclude driving for several hours after it has been completed. *A candidate who wears contact lenses must remove them a minimum of 72 hours prior to the examination.*

A candidate will be required to provide his medical history to the flight surgeon during the medical examination. He should consult with his parents concerning his medical history and furnish written information to the flight surgeon. This should include a summary covering any period of hospitalization or prolonged out-patient treatment during the year preceding the examination.

When the examinations are completed, all forms and records are sent from the examining center to the Physical Standards Branch, Air Force Academy. The examining center is not authorized to make a decision regarding the qualifications of any candidate. The medical decision made by the Physical Standards Branch will be final. If the candidate is found qualified he will not be required to take another medical examination for any subsequent nominations he may receive. If he is found disqualified due to a non-remediable condition, no further testing as a candidate will be authorized. If the disqualification is determined remediable, he will be notified of the corrective measures he must take at his own expense in order to be reexamined. He must promptly complete any requirements to avoid delay in determining his final medical status. Each candidate will be notified of the results of his examination.



A candidate who does not meet the medical requirements for flying, may be considered for a waiver if his records indicate outstanding academic or leadership aptitude and achievement. The decision to grant a waiver will be made by the Academy Board at the time of final selection in April and will be based upon the level of attainment on scored selection measures. *Requests for waivers are not required since consideration will be automatic. A candidate is advised not to make inquiries to the Academy regarding the status of waiver action.*

If a candidate for the Air Force Academy desires to have copies of his examination forwarded for consideration by the Army or the Navy, he must request the chief of the examining facility to do so at the time he is examined. For the Military Academy a candidate should request copies be sent to: The Surgeon General, Department of the Army, ATTN: Physical Standards Branch, Washington, D.C. 20315. For the Naval Academy copies should be sent to: The Board of Medical Examiners, United States Naval Academy, Annapolis, Maryland 21402.

### **Physical Aptitude Examination**

Every candidate to the Air Force, Army and Naval Academies must take a physical aptitude examination which includes a series of exercises designed to measure coordination, strength, endurance, speed and agility. A list of test items is included in the Admissions Appendix.

A candidate will be scheduled to take the qualifying medical examination and the physical aptitude examination at an Air Force Academy Examining Center. If for medical reasons a candidate is unable to report to the center on the date specified, he should submit a request to the Director of Admissions to be re-scheduled for a later test.

A candidate must take the physical aptitude examination each year he may compete for an appointment to the Air Force Academy. *Once the examination has been taken during the current testing cycle, retests are not authorized.*

### **College Entrance Examination Board Tests**

A candidate will be required to take the following College Entrance Examination Board tests. (No substitutes can be made for item 1 through item 4 listed below.)

#### **Scholastic Aptitude Test**

1. Verbal Section
2. Mathematics Section

## Achievement Tests

3. Level I (Standard) Mathematics or Level II (Intensive) Mathematics. (Select one — Level I recommended for candidates without advanced high school mathematics.)
4. English Composition
5. A candidate is encouraged, but not required, to take a third achievement test of his choice. It may be used by the Academy for validation and placement purposes.

The scholastic aptitude test is designed to measure the student's ability and readiness to undertake studies at the college level. The test measures basic skills and abilities with emphasis on the reasoning faculty rather than on rote memory. The verbal section stresses the ability to read with comprehension, to reason with verbal material, and to perceive word relationships. The mathematical section measures the ability to understand mathematical relationships and to solve problems. The achievement tests are one-hour, multiple-choice tests dealing with specific areas of knowledge. Each test requires knowledge of important facts in a specific field of study as well as the ability to reason with those facts.

The College Board publishes descriptive booklets entitled *A Description of the College Board Scholastic Aptitude Test* and *A Description of the College Board Achievement Tests*. Most secondary schools have a supply of these booklets. If a candidate is unable to obtain copies at his school, he may write to the nearest College Board office and request that the booklets be sent to him.<sup>1</sup> There is no charge for the booklets. They describe all tests given during the current school year.

The Director of Admissions will forward to the candidate a bulletin of information listing the location of test centers and a registration card. The fee for each administration of the College Board tests will be paid for by the applicant. The candidate must choose the center where he wishes to take the tests and mail his registration card and test fees to the College Entrance Examination Board. The board will schedule the candidate to take the tests at the center he chooses if the quotas have not been filled, otherwise at another center which may be located in his community or usually not more than 75 miles away.

<sup>1</sup>To request the College Board descriptive booklets, candidates should write to the College Entrance Examination Board either at Box 592, Princeton, N.J. 08540, or Box 1025, Berkeley, Calif. 94701. Candidates who live in Montana, Wyoming, Colorado, New Mexico and states west should write to the California office; others should write the New Jersey office.

College Board testing dates for Academy candidates are:

Scholastic aptitude only . . . . .	2 November 1968
	7 December 1968
Aptitude and achievement . . . . .	11 January 1969
	1 March 1969

Candidates are encouraged to take the tests on one or more of these dates. If unavoidable circumstances arise which make it impossible for a candidate to take the tests on one of the regular dates, he may submit a request to be scheduled on the make-up date of 15 March, the last possible time to take the tests. A letter explaining his reason for requesting the make-up date should be sent to the Director of Admissions.

The College Board tests on 15 March will be given only at Air Force Examining Centers. This means that a candidate might be scheduled to take the tests at a center which is a considerable distance from his home. Therefore, each candidate should take the tests on one of the regular dates unless it is absolutely impossible.

A candidate living in a remote area overseas may not be able to take the College Board tests in his home community. In this case, the candidate should register for the College Board tests at a location nearest to the Examining Center where he will take his medical and physical aptitude examinations. These examinations will be scheduled to coincide with the three College Board testing dates so that a candidate will be able to complete all tests during one trip. The College Board tests will be held on Saturday, 7 December, 11 January, and 1 March previous to the Air Force examinations on the following Mondays.

*Only scores of tests taken during November, December, January or March will be accepted for admissions purposes.* However, a candidate can take the tests more than once during that period in an effort to improve on his previous scores. Each time he registers for the tests, he must request that all of his scores be furnished to the Academy by the College Board.

### **Prior School Records**

In addition to his test scores, the Academy considers a candidate's high school academic performance and leadership potential in judging his qualifications for a cadet appointment. A candidate's high school rank-in-class is the principal measure of his academic achievement. The majority of young men appointed to the Academy rank in the top quarter of their graduating classes. A candidate is not likely to receive an appointment unless he ranks



at least in the top forty percent of his class. Experience has shown that a young man graduating below that level ordinarily will not have a reasonable chance of completing the academic curriculum of the Academy. A possible exception is the candidate who has outstanding college or preparatory school work indicating that he can compensate for a weak high school academic record. A candidate must submit all school transcripts as records of his academic performance along with his latest rank-in-class. Each transcript submitted must be authenticated by the appropriate school authority.

A candidate's leadership potential also is considered an important part of his qualifications. This potential is evaluated from his record of participation and distinction in high school extra-curricular activities. The candidate must submit a record of all athletic and non-athletic activities in which he participated from grades 9 through 12. He is required to obtain statements from three instructors who are qualified to evaluate his potential.

### **Documentary Evidence**

*Social Security Card* — Each appointee must present a Social Security card upon reporting for admission. Any candidate who does not have a Social Security number should apply for an account number in order to have his card available if he receives an Academy appointment. The application form (Treasury Department Form SS-5) may be obtained from his local Post Office or the Social Security Administration district office.

*Birth Certificate* — A candidate must submit a certificate of birth issued by the state or local office of birth registration (Bureau of Vital Statistics). The certificate in the form of a certified copy of the original report of birth is preferred. It should contain the written signature of the registrar or other custodian of the original record and the seal of his office. All items on this record must be legible. Baptismal or hospital certificates are not acceptable. Birth certificates found to be in error should be corrected through the appropriate bureau of Vital Statistics prior to submission.

*Name Changes* — A candidate must use his name as it appears on his birth certificate on all official records. If he wishes to use a different name, he must provide the Director of Admissions with legal evidence, such as a court order authorizing a name change. Until the appropriate documents are received, his name will be entered in the records as it appears on his birth certificate. Should he receive a cadet appointment, he will be

sworn in under his birth certificate name unless acceptable documents have been received to substantiate a name change.

*Adopted Son* — If a candidate is an adopted son who is claiming eligibility in a nominating category through his adoptive parent, he must submit a copy of the court order or other legal evidence of adoption.

*Naturalized Citizens* — If the candidate received United States citizenship by naturalization, he must submit a statement from a notary public indicating that the notary has seen the certificate of naturalization. The notary's statement must include the certificate number, court name and location, date of certificate, and the full name, place and date of birth as they appear on the certificate. *Do not submit the original naturalization certificate.*

*Claiming Citizenship Through Parent or Parents* — If a candidate was born to United States citizens while they were outside of the United States, he must submit a statement from a notary public indicating that the notary public has seen the certificate of citizenship. The statement must contain all information as illustrated in the following format.

#### **FORMAT FOR NOTARY PUBLIC STATEMENT**

Director of Admissions (date)

USAF Academy, Colorado 80840

I certify that I have examined the certificate of naturalization/citizenship of (*candidate's first, middle and last name*) and the following information was extracted therefrom:

Court Name and Location \_\_\_\_\_

Certificate Number \_\_\_\_\_

Date of Certificate \_\_\_\_\_

Full Name \_\_\_\_\_

Place of Birth \_\_\_\_\_

Date of Birth \_\_\_\_\_

\_\_\_\_\_  
(Signature, Notary Public)

*The original certificate should not be sent to the Academy.* A certificate of citizenship may be secured from the nearest office of the Immigration and Naturalization Service. Completion is required of an "Application for Certificate of Citizenship," Form N-600. This requirement applies to children born overseas of military personnel or civilians who are United States citizens.

## EVALUATION AND SELECTION OF CANDIDATES

Selection panels, comprised of senior officers assigned to the Academy, meet in April to evaluate qualifications of the candidates. The evaluation is based on scores derived from the entrance examinations, prior school performance, and recommendations reflected in documents submitted. A rating is assigned to each of the following factors:

- High school academic rank-in-class
- College Board tests  
(English and mathematics aptitude and achievement)
- Leadership record  
(high school athletic and non-athletic activities)
- Physical aptitude examination
- Overall selection panel evaluation and rating

In addition to the rated factors above, a candidate must be medically qualified for the Academy as determined by the Air Force Academy qualifying medical examination. A composite rating is determined for each candidate based on a combination of each factor above. A minimum-qualifying composite score is established, according to previous experience, indicating the qualifications a cadet must have to stand a reasonable chance of succeeding at the Academy. If a candidate's composite score is equal to or above the minimum qualifying score, he is qualified for admission. Each qualified candidate competes for an appointment only with the other qualified candidates entered in a particular nominating category. Individual and composite scores of the qualified candidates are compared and those with the top scores are recommended to fill the available cadet vacancies. The selection panel recommendations for Academy appointments are presented for approval to the Academy Board, composed of the Superintendent and his key staff officers. The appointment recommendations are subject to final approval of the Secretary of the Air Force.

Candidates who hold principal nominations, as well as certain highly qualified candidates, may be notified of their appointments as soon as they meet all entrance requirements. Notifications will be sent periodically after mid-January. All other candidates selected for appointments will be notified late in April or early in May. Since a few selected candidates may decline their appointment offers, it is possible that some qualified candidates may not be notified of appointments until shortly before the entry of the new class in June.



## **REQUIREMENTS OF CADET APPOINTEES**

### **Admission Deposit**

Each appointee will be requested to deposit \$300 before being admitted to the Academy. This deposit is necessary to help defray the initial costs of uniforms, supplies and other personal expenses. All deposit checks, money orders, bank drafts, etc., should be made payable to The Treasurer of the United States and mailed to the Accounting and Finance Office (DCAF), USAF Academy, Colorado 80840. In cases of extreme hardship this deposit may be reduced. Requests for waiver should contain full justification. An appointee who is unable to make a full deposit will receive reduced money allowances until his account reaches prescribed levels.

The \$300 deposit is supplemented by a \$600 credit at time of admission to the Academy. The \$600 is an interest free loan advanced by the government to defray the cost of the uniforms and equipment required during the first year. This loan must be repaid during the time a cadet is in training. The repayment is accomplished by recouping from the cadet the portion of his monthly pay not required for books, clothing, laundry, income tax, and other required items of expense. Recoupment continues until the \$600 is repaid.

Cadets who are involuntarily separated from the Academy prior to repayment of the \$600 will have all excess pay and allowances applied against the indebtedness. If the indebtedness is not satisfied by such application of funds, the cadets are permitted to turn in enough clothing and equipment of a distinctive military nature to liquidate the remaining balance. Cadets who are voluntarily separated for their own convenience are required to repay in full the amount of such indebtedness.

### **Travel Expenses**

Except for a member of the armed forces who is provided transportation under Joint Travel Regulations, each appointee is normally allowed six cents per mile for travel expenses to the Academy from his home in the United States or point of entry into the country. Travel outside the continental limits of the United States is normally reimbursed at the rate of six cents per mile for land travel and actual cost of travel by commercial ship or air, provided government transportation is not available. Travel allowances will be credited to the individual's account following admission unless he makes a specific request that the money be sent to his parents. If the allowance is credited to his account, he may apply the sum toward his admission deposit.

## Obligations of Cadet Appointment

Upon admission each cadet will be required to take the following Oath of Allegiance: "I, \_\_\_\_\_ (name), having been appointed an Air Force Cadet in the United States Air Force, do solemnly swear (or affirm) that I will support and defend the Constitution of the United States against all enemies, foreign and domestic; that I will bear true faith and allegiance to the same; that I take this obligation freely, without any mental reservation or purpose of evasion; and that I will well and faithfully discharge the duties of the office on which I am about to enter. So Help Me God."

A cadet who enters the Air Force Academy directly from a civilian status and takes an oath of allegiance as a cadet assumes a military service obligation of six years.

Each cadet will be required to sign an agreement, with the consent of his parents or guardian if a minor, that he will fulfill these obligations:

1. Complete the Academy course of instruction, unless he is disenrolled from the Academy by competent authority.
2. Accept an appointment and serve as a commissioned officer in a Regular component of one of the armed services for five years.
3. If authorized to resign from the Regular component before the sixth anniversary of his graduation, serve as a commissioned officer in the Reserve component until the sixth anniversary.
4. If disenrolled from the Academy before graduation, he will be subject to the following separation policies which apply to all service academies. Application of these policies will be governed by the Department of Defense requirements for the Active and Reserve components and the national manpower needs of selective service.

### *Legal Provisions*

- a. A cadet who enters the Academy directly from a civilian status assumes a military service obligation of six years (Title 10, U.S.C. 651).
- b. A cadet who enters the Academy from the Regular or Reserve component of any service, upon separation from cadet status, normally will revert to his former status for the completion of any prior service obligation (Title 10, U.S.C. 516). However, completion or partial completion of a prior service obligation by a separated cadet who entered from this status does not necessarily exempt him from transfer to a Reserve component and call to active duty. (Title 10, U.S.C. 9348).
- c. A cadet who does not fulfill his agreement to complete the course of instruction and accept a commission may be transferred to the Air Force Reserve component in an appropriate enlisted grade and may be ordered to active duty for a period of time which cannot exceed four years (Title 10, U.S.C. 9348b).

### *General Policy*

- a. A cadet who is separated and who entered the Academy from the Regular or Reserve component of any service normally will revert to his

former status under the appropriate statutory provisions. However, he may be transferred to a Reserve component in an appropriate enlisted grade and may be ordered to active duty under appropriate statutory provisions.

b. A cadet who is separated from the Academy because of physical disability or because of demonstrated unsuitability or unfitness for military service will be discharged in accordance with current regulations of the Air Force.

c. A cadet who tenders a resignation will be required to state a specific reason for his action. The Air Force will establish appropriate procedures to determine whether each case comes under the criteria established to determine what constitutes demonstrated unfitness or unsuitability for military service.

#### *Specific Policy for Cadets/Midshipmen Who Were Not in a Regular or Reserve Status on Entry into the Service Academy*

a. *Fourth and Third Classmen (1st and 2nd years).* Any Fourth or Third Classman who is separated or whose resignation is accepted will be discharged in accordance with current regulations of the Air Force. A resignation tendered by a Fourth or Third Classman will be accepted when found to be in the best interests of the service. In accordance with an agreement between the Department of Defense and the Director, Selective Service System, notification will be made to the local Selective Service Board advising a change in the individual's status in each case where a cadet is separated from the Academy.

b. *Second and First Classmen (3rd and 4th Years).* A Second Classman who is separated prior to the commencement of the Second Class academic year will be discharged in accordance with current regulations of the Air Force. With the commencement of the Second Class academic year, a Second or First Classman who is separated prior to completing the course of instruction, except for physical disability, unfitness or unsuitability, will normally be transferred to the Reserve component in an enlisted status and be ordered to active duty for not less than two years. Where separation occurs as a result of deficiencies, which are not considered *wilfull*, the active duty provision may be waived.

c. *Refusal to Accept Commission.* Any First Classman who completes the course of instruction and declines to accept an appointment as a commissioned officer will be transferred to the appropriate Reserve component in an appropriate enlisted status and ordered to active duty for four years.

### **Basic Cadet Resignation Policy**

In every class there are a few cadets who do not adjust to the Air Force Academy and wish to resign. The Academy considers that each cadet should give himself and the Academy a fair trial and evaluation. Some new cadets who find it difficult to live up to the high standards of discipline and physical endurance during Basic Cadet Training will be able to adjust after the academic year begins. To allow proper time for adjustments and decisions, ordinarily the Academy will not favorably consider cadet resignations until after the sixth week of the academic year, which occurs around the first of October. After that time, Academy officials may recommend that the Air Force approve the resignation of any cadet whose continuation would not be in the best interests of the Air Force or the cadet.



# Admissions Appendix

## PHYSICAL APTITUDE EXAMINATION ITEMS

The items to be included in this examination normally will be selected from those listed below, and the grade will be on the basis of total score. Candidates are advised to prepare for this exam by engaging in vigorous physical activities rather than practicing on specific test items.

1. *Medicine Ball Put* — Put a six pound medicine ball for distance using the same movement as required for a shot put.
2. *Chinups* — From the arm hang position on a horizontal bar, palms toward the face, elevate the body until the chin is above the bar.
3. *Pullups* — Same as chinups except palms away from the face.
4. *Situps* — Perform as many situps as possible in two minutes.
5. *Hurdle Run, Zig Zag Run, and Dodge Run* — Run through a maze of hurdles on a gymnasium floor for time.
6. *Shuttle Run* — Run between two turning blocks, 25 yards apart, to cover distances from 100 to 400 yards.
7. *Squat Thrust* — Continuous movements for 20 seconds from the standing position to the squat, to the leaning rest, to the squat, and back to the standing position.
8. *Vertical Jump* — Jump for height.
9. *Standing Broad Jump* — One jump for distance.
10. *Three Broad Jumps* — Three successive broad jumps for distance.
11. *Rope Climb* — Climb a regular gymnasium rope as high as possible in seven seconds using hands and feet or hands alone, starting from a standing position.
12. *Instep Touch* — From the arm hand position on a horizontal bar, bring the insteps up to touch the bar.
13. *Hop, Step and Jump* — With a ten foot start to the takeoff line, take a hop, a step, and a jump in a continuous movement for distance.
14. *Basketball Throw* — Throw a regulation basketball for distance from either a standing or kneeling position.
15. *Basketball Pass* — Pass a basketball against a wall for speed and accuracy.

16. *Block Shuttle Run* — In a shuttle run, pick up blocks and place them on designated spots.
17. *Dips* — Raising and lowering oneself on parallel bars with the arms.
18. *Pushups* — Standard pushups starting from the leaning rest position.

## **MEDICAL DISQUALIFICATION FACTORS**

Before applying for a nomination to the Air Force Academy, a young man is urged to have a thorough preliminary examination by his private doctor and dentist using the disqualifying medical conditions set forth below. Medical and dental defects which are remediable should be corrected prior to taking the qualifying medical examination. An individual who has defects which are not remediable and would obviously disqualify him should not continue to seek a nomination or appointment to the Academy. A medical examination by an applicant's civilian physician is a preliminary one *only* and cannot be considered as a qualifying examination. Only examinations given at Air Force, Army or Navy medical facilities are acceptable as a qualifying examination.

The medical disqualifying factors below apply to the United States Air Force Academy, the Military Academy, and the Naval Academy. The standards are the same for most factors. Where the standards differ, a breakdown for each Academy is listed.

### **Medical History**

The medical history will be compiled with particular care with elaboration where indicated. Full and complete documentation of all illnesses, injuries and operations which the applicant may have incurred is absolutely necessary since failure to do so may result in disappointment when medical disqualification is determined later. A history of familial diseases will be thoroughly investigated. Medical care which has significantly affected the applicant's medical status must be documented and supported by statements from the attending physician or from hospital records concerning the medical care.

### **Height and Weight Standards**

The weight standards as noted are necessarily flexible and as a general rule will not be waived. However, when a generally large bony structure and large well-distributed and proportioned muscle masses with little evidence of thick layers of subcutaneous fat account for the apparent excessive weight, exception to the standards may be granted. Underweight conditions will not be waived. Gross obesity is a disqualifying factor until such time as excess weight is lost. In any event, each case will be judged on its own merits. Heights should be measured to the nearest half inch. Standards of weight according to height are approximately as follows:

HEIGHT	MINIMUM	MAXIMUM	HEIGHT	MINIMUM	MAXIMUM
64 (b)	112	160	73	143	215
65 (b)	115	165	74	147	219
66 (a)	115	176	75	151	224
67	119	180	76	155	229
68	122	186	77	159	235
69	127	191	78 (c)	162	240
70	131	197	79 (b)	169	245
71	135	202	80 (b) (a)	173	250
72	139	208			

- (a) USAFA — Minimal height is 66 inches. Maximum 80 inches. On the recommendation of the Superintendent, USAFA, these standards may be waived.
- (b) USMA — A range in height from 66" to 78" inclusive is required. A waiver for overheight or for up to 2" below the minimum height, may be considered by the Department of the Army provided the candidate possesses exceptional educational qualifications or has an outstanding military record, or has demonstrated outstanding abilities.
- (c) USNA — Maximum height allowable 78 inches.

## Eyes and Vision Disqualifications

### VISION

USMA	USNA	USAFA*
Any visual acuity must correct to 20/20 with glasses (See refractive error)	Uncorrected vision exceeding 20/20 in each eye.	Uncorrected vision exceeding 20/20 in each eye. (See refractive error.)

### MUSCLE BALANCE

USMA	USNA	USAFA
<i>Esophoria</i> over 15 prism diopters	No requirement.	<i>Esophoria</i> over 10 prism diopters.
<i>Exophoria</i> over 10 prism diopters	No requirement.	<i>Exophoria</i> over 5 prism diopters.
<i>Hyperphoria</i> over 2 prism diopters	No requirement.	<i>Hyperphoria</i> over 1 prism diopters.

Strabismus (tropia) disqualifying for all candidates.

### COLOR VISION

Must be able to distinguish vivid red and vivid green.	Normal color perception.	Normal color perception.
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### CYLOPLEGIC REFRACTION

All Candidates.	All Candidates.	All Candidates.
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\*Uncorrected far visual acuity up to 20/50 each eye which corrects to 20/20 with lenses will be considered qualifying for flying other than pilot.



## REFRACTIVE ERROR

### *MYOPIA*

Exceeding —5.50  
diopters in any  
meridian.

Exceeding —3.00  
diopters in any  
meridian.

Exceeding —.25  
diopters in any  
meridian.

### *HYPEROPIA*

Exceeding +5.50  
diopters in any  
meridian.

Exceeding +5.5  
diopters in any  
meridian.

Exceeding +1.75  
diopters in any  
meridian.

### *ASTIGMATISM*

Exceeding + or  
—3.00 diopters.

No requirement.

Exceeding + or  
—.75 diopters

### *ANISOMTROPIA*

Exceeding 3.50  
diopters.

No requirement.

Exceeding 3.50  
diopters.

## CONTACT LENSES

Removed 72 hours  
prior to examination

Removed 72 hours  
prior to examination

Removed 72 hours  
prior to examination

### *WAIVER*

No requirement.

20/40 vision corrected  
to 20/20 and exceptional  
scholastic and leadership  
achievement.

Visual acuity not exceeding  
20/200 correctible to  
20/20 and outstanding  
academic or leadership  
achievement.

## Ears and Hearing Disqualifications

The auditory acuity of all candidates will be determined by the use of the audiometer. Maximum loss in decibels in these frequencies will be noted and evaluated. The following will be disqualifying for the USAFA: Hearing loss in excess of 15 decibels at the 500, 1000, or 2000 frequency ranges in either or both ears, and/or a total of 210 decibels for the six thresholds at 3000, 4000, and 6000 frequency ranges.

### FREQUENCY

500	1000	2000	3000	4000	6000	8000
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Both ears must be free from any disfiguring or incapacitating abnormalities. Other causes for rejection are: Existing perforations of the tympanic membrane regardless of etiology. Exostosis or other forms of canal blockage resulting in examiner's inability to effectively view the tympanic membrane may be cause for rejection.

## Nasal Disqualifications

Any congenital or acquired lesion which interferes with the functions of the nasopharynx or eustachian tubes. Septal deviation, allergic rhinitis, nasal polyps or other conditions which result in 50% or more obstruction to either airway or obstruction to drainage of any sinus. History of acute or chronic sinusitis will be evaluated thoroughly and completely.

## **Lungs and Chest Disqualifications**

Tuberculosis active in past 5 years. Spontaneous pneumothorax within past 3 years or history of repeated episodes. Chronic bronchitis, bronchiectasis. Congenital malformations that result in reduced chest capacity with associated diminution of respiratory reserve, absence of the clavicle, ununited fractures of the clavical which would interfere with carrying military equipment. Coccidioidomycosis unless healed without residual. The USMA standards differ in that pneumothorax, regardless of etiology or history thereof, is disqualifying.

## **Allergic Disqualifications**

Asthma or a history of Asthma, except a history of childhood asthma with a trustworthy history of freedom from symptoms since the 12th birthday, is a cause for rejection. A history of allergic rhinitis past the 12th year, including those cases in which desensitization therapy has been initiated, will be evaluated thoroughly. In many cases a specialty consultation in allergy will be required.

## **Skin Disqualifications**

Psoriasis, even if moderate in degree. Acne, moderately severe or resultant scarring severe enough to interfere with wearing of personal military equipment or disfiguring scarring. Chronic skin disease such as severe eczema or unsightly congenital markings. Bromidrosis which is more than mild. Pilonidal cyst if evidenced by presence of mass or discharging sinus. History of pilonidal cystectomy within two years previous to examination is not disqualifying for the USMA. Extensive deep or adherent scars that interfere with movement or wearing of military equipment.

## **Heart and Vascular System Disqualifications**

An electrocardiogram is required of all applicants. Electrocardiogram abnormalities will be evaluated to determine if an organic basis exists. A history of rheumatic fever will require a thorough investigation including detailed history, fluoroscopic examination of the heart and an X-ray film in addition to a careful general medical examination. All murmurs will be evaluated thoroughly and indicated as functional or organic in origin. Any evidence of organic heart disease is unequivocally disqualifying. All valvular disease, including those improved by surgery. Blood pressure greater than 140 millimeters systolic or diastolic pressure greater than 90 will be cause for extensive evaluation to determine if there is any cardiovascular pathology. Heart rate greater than 100 on repeated examinations will be cause for further evaluation. Varicosities of any extremities if severe or symptomatic unless mild in degree or correctable by treatment.

## **Genito-urinary System Disqualifications**

Persistent albuminuria of any type to include so-called orthostatic albuminuria or the persistence of casts in the urine, even though the etiology cannot be determined, will be cause for rejection. Phimosis, epispadias, or pronounced hypospadias severe enough to interfere with micturition. Amputation of the penis, infantile genitalia, atrophy, absence, deformity or maldevelopment of *both* testicles, or undescended testicle of any degree unless surgically corrected. Chronic orchitis or epididymitis. Chronic kidney diseases. Repeated attacks of renal calculi. Absence of one kidney, regardless of cause.

## **Serologic Test**

A serologic test for syphilis is required for all applicants.

## **Abdomen Disqualifications**

Weakness of abdominal wall sufficient to interfere with function. Hernias of any type unless surgically corrected. History of operation for hernia within past 60 days is temporarily disqualifying. Chronic diseases of abdominal viscera. History of gastric or duodenal ulcer. Acute or chronic gallbladder disease. History of splenectomy for any reason other than trauma.

## **Orthopedic Disqualifications**

Ununited fractures, old joint fractures with evidence of arthritis. Pes planus more than mild, symptomatic or with marked bulging of the inner border due to rotation or eversion of the astragalus and any callosities. Pes cavus with clawing of the toes and calluses beneath the metatarsal heads can be cause for rejection. Hammertoes of such degree as to interfere with function or wearing of suitable footwear. Other conditions of the feet which would interfere with successful compliance with military routine. History of derangement of knee joint not corrected by surgery if symptomatic within one year preceding examination. Six months must elapse after knee surgery before final evaluation. Post-operative instability, stiffness, traumatic arthritis, muscle atrophy or weakness may be cause for rejection.

## **Spine and Musculoskeletal Disqualifications**

Lateral deviation of the spine (scoliosis) from the midline of more than one inch. Old vertebral fractures. Curvature of the spine of any degree in which there is noticeable deformity when the applicant is dressed. Spondylolisthesis. Gout. Deficient muscular development. Tuberculosis of spine, active or healed. Acute or chronic back problems which would interfere with routine military duties. History of herniated nucleus pulposus or surgical correction of such a condition is cause for disqualification.

## **Extremities Disqualifications**

Total loss of either thumb. Loss of other digits sufficient to interfere with function. Loss of either great toe.

## **Neurological Disqualifications**

History of head injury resulting in unconsciousness will be thoroughly evaluated. Lengthy periods of unconsciousness will require a complete neurological consultation to include electroencephalogram. Degenerative disorders, convulsive disorders, even though controlled by medication. Residuals of infection (polio, meningitis, etc.). Miscellaneous disorders such as tics, spasms and spina bifida, if associated with neurological manifestations. All periods of amnesia will be evaluated thoroughly and completely regardless of length. History of unexplained unconsciousness. Multiple episodes of syncope (fainting). Documented history of migraine headaches or chronic headaches of such a nature as to interfere with daily functions or requiring medical treatment. A history of multiple episodes of air sickness (air, sea, swing, train or carnival ride) will be thoroughly evaluated and may be cause for rejection.

## **Psychiatric Disqualifications**

History of emotional instability, psychosis, anxiety reaction or dissociative reaction. Pathologic personality types; other obsessive compulsive reactions or neurotic depressive reaction. Addiction to alcohol or drugs. Anti-social behavior. Sexual deviation. Immaturity reaction if marked; situational maladjustment. Multiple episodes of somnambulism after 10 years of age. Multiple episodes of enuresis (bedwetting) after 10 years of age unless proven to have an organic basis. Stammering or stuttering past the age of 10 years. History of attempted suicide. Other disorders of emotion,



behavior, thought, intelligence or mood, difficult to define, will be thoroughly evaluated and may be cause for rejection. DD Form 1525 (Personal History Booklet) will be completed by all applicants to the US Naval Academy.

### **Endocrine and Metabolic Disqualifications**

Diabetes mellitus or history of diabetes mellitus in both parents is disqualifying. History of diabetes mellitus in both parents is not disqualifying for the USMA. Persistent glycosuria including renal glycosuria is disqualifying. Exophthalmic or adenomatous goiter, from any cause associated with toxic symptoms. History of thyroidectomy. History of partial thyroidectomy will be cause for thorough evaluation and may be disqualifying. Other endocrine or metabolic disorders which preclude satisfactory performance of duty or which would require long term treatment.

### **Dental Disqualifications**

1. Carious teeth which are unfilled or improperly filled or restored.
2. Prosthetic appliances below standards of design, construction and tissue adaptation.
3. Insufficient natural teeth to adequately stabilize a lower partial denture.
4. Grossly disfiguring spacing of anterior teeth.
5. Insufficient opposing natural or artificial teeth to permit mastication of normal diet (16 minimum, 8 maxillary — 8 mandibular).
6. Diseases of the jaws or associated structures such as cysts, tumors and chronic infections which are not easily remedied and will incapacitate the individual.
7. A relationship between the mandible and the maxilla which will preclude satisfactory prosthodontic replacement should it become necessary to remove any or all of the remaining natural teeth.
8. Orthodontic appliances attached to the teeth for continued treatment (retainer appliances are acceptable). Each case will be considered on an individual basis.



# AIR FORCE ACADEMY EXAMINING CENTERS

## **Alabama**

Maxwell AFB, Montgomery

## **Alaska**

Elmendorf AFB, Anchorage

## **Arkansas**

\*Blythesville AFB, Blythesville  
Little Rock AFB, Jacksonville

## **Arizona**

Davis-Monthan AFB, Tucson  
Williams AFB, Chandler

## **California**

\*Beale AFB, Marysville  
Castle AFB, Merced  
Edwards AFB, Edwards  
\*George AFB, Victorville  
\*Hamilton AFB, San Rafael  
March AFB, Riverside  
\*Mather AFB, Sacramento  
McClellan AFB, Sacramento  
Travis AFB, Fairfield  
\*Vandenberg AFB, Lompoc

## **Colorado**

USAF Academy  
Lowry AFB, Denver

## **Delaware**

Dover AFB, Dover

## **Florida**

\*Eglin AFB, Valparaiso  
\*Homestead AFB, Homestead  
MacDill AFB, Tampa  
\*Tyndall AFB, Panama City

## **Georgia**

Moody AFB, Valdosta  
Robins AFB, Warner Robins  
\*Turner AFB, Albany

## **Hawaii**

Hickam AFB, Honolulu

## **Idaho**

Mountain Home AFB,  
Mountain Home

## **Illinois**

Chanute AFB, Rantoul  
Scott AFB, Belleville

## **Indiana**

Bunker Hill AFB, Peru

## **Kansas**

McConnell AFB, Wichita

## **Louisiana**

Barksdale AFB, Shreveport  
\*England AFB, Alexandria

## **Maine**

Dow AFB, Bangor  
\*Loring AFB, Limestone

## **Maryland**

Andrews AFB, Camp Springs

## **Massachusetts**

Otis AFB, Falmouth  
Westover AFB, Chicopee Falls

## **Michigan**

\*Kincheloe AFB, Kinross  
K. I. Sawyer AFB, Gwinn  
Selfridge AFB, Mt. Clemens  
Wurtsmith AFB, Oscoda

## **Mississippi**

\*Columbus AFB, Columbus  
Keesler AFB, Biloxi

## **Missouri**

\*Richards-Gebaur AFB,  
Grandview  
Whiteman AFB, Knob Noster

## **Montana**

\*Glasgow AFB, Glasgow  
Malmstrom AFB, Great Falls

## **Nebraska**

Offutt AFB, Omaha

## **Nevada**

Nellis AFB, Las Vegas

## **New Hampshire**

\*Pease AFB, Portsmouth

## **New Jersey**

McGuire AFB, Wrightstown

## **New Mexico**

\*Cannon AFB, Clovis  
\*Holloman AFB, Alamogordo  
Kirtland AFB, Albuquerque

## **New York**

Griffiss AFB, Rome  
\*Plattsburgh AFB, Plattsburgh  
Stewart AFB, Newburgh  
Suffolk County AFB,  
Westhampton Beach, L. I.

## **North Carolina**

Seymour Johnson AFB,  
Goldsboro

## **North Dakota**

Grand Forks AFB, Mekinock  
Minot AFB, Minot

## **Ohio**

Lockbourne AFB, Columbus  
Wright-Patterson AFB, Dayton

## **Oklahoma**

\*Altus AFB, Altus  
\*Clinton-Sherman AFB,  
Burns Flat  
Tinker AFB, Oklahoma City

## **South Carolina**

\*Charleston AFB, Charleston  
Shaw AFB, Sumter

## **South Dakota**

Ellsworth AFB, Rapid City

## **Tennessee**

Sewart AFB, Smyrna

## **Texas**

\*Amarillo AFB, Amarillo  
\*Bergstrom AFB, Austin  
Carswell AFB, Fort Worth

\*Dyess AFB, Abilene  
\*Lackland AFB, San Antonio  
\*Laughlin AFB, Del Rio  
Perrin AFB, Sherman  
Randolph AFB, San Antonio  
\*Reese AFB, Lubbock  
Sheppard AFB, Wichita Falls  
Webb AFB, Big Spring

## **Utah**

Hill AFB, Ogden

## **Virginia**

Langley AFB, Hampton

## **Washington**

Fairchild AFB, Spokane  
McChord AFB, Tacoma

## **Wyoming**

Francis E. Warren AFB,  
Cheyenne

## **American Samoa**

\*Department of Medical Services  
Pago Pago, Tutuila

## **Canal Zone**

Albrook AFB, Balboa

## **England**

RAF South Ruislip AS,  
Middlesex

## **Germany**

Wiesbaden AB, Wiesbaden

## **Japan**

Tachikawa AB, Honshu

## **Philippine Islands**

Clark AB, Luzon

## **Puerto Rico**

Ramey AFB, Aguadilla

## **Spain**

Torrejon AB, Madrid

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\*Examining Centers with an asterisk will administer medical examinations only.



**FORMAT**  
**Request for Congressional Nomination**

Date

The Honorable .....  
House of Representatives  
Washington, D.C. 20515

OR

The Honorable .....  
United States Senate  
Washington, D.C. 20510

Dear Mr. ....:

Dear Senator ....:

It is my desire to attend the Air Force Academy and to make the United States Air Force my career. I respectfully request that I be considered as one of your nominees for the class that enters the Academy in June 1969.

The following personal data are furnished for your information:

Name: *(Print as recorded on birth certificate)*

Address: *(City, County, State, Zip Code)*

Name of Parents:

Date of Birth: *(Spell out month)*

High School Attended:

Date of High School Graduation:

Approximate Grade Average:

Social Security Number:

I have been active in high school extracurricular activities shown on the attached list.

I shall greatly appreciate your consideration of my request for a nomination to the Air Force Academy.

Sincerely,

Signature

Note: Send applications to Members of Congress only; do not send copies to the Air Force Academy. Same format applies to District of Columbia, Canal Zone, Puerto Rico, American Samoa, Guam, and the Virgin Islands. Address to the appropriate nominating authority.

## FORMAT

### Request for Vice Presidential Nomination

Date

The Vice President  
United States Senate  
Washington, D.C. 20501

Dear Mr. Vice President:

It is my desire to attend the Air Force Academy and to make the United States Air Force my career. I respectfully request that I be considered as one of your nominees for the class that enters the Academy in June 1969.

The following personal data are furnished for your information:

Name: *(Print as recorded on birth certificate)*

Address: *(City, County, State, Zip Code)*

Parent's Name:

Date of Birth: *(Spell out month)*

High School Attended:

Date of High School Graduation:

Approximate Grade Average:

Social Security Number:

I have been active in high school extracurricular activities shown on the attached list.

I shall greatly appreciate your consideration of my request for a nomination to the Air Force Academy.

Sincerely,

Signature

**FORMAT**  
**Request for Presidential Nomination**

Date

Director of Admissions  
USAF Academy, Colorado 80840

Dear Sir:

I request a nomination under the Presidential category for the class that enters the Academy in June 1969 and submit the following data:

Name: *(Print as shown on birth certificate. If different from that which you use, attach a copy of court order, if applicable.)*

Address: *(Give permanent and temporary addresses.)*

Date and Place of Birth: *(Spell out month.)*

Date of High School Graduation:

Social Security Number:

If Member of Military: *(List rank, serial number, Regular or Reserve component, branch of service, and organizational address including CMR or Box No.)*

If Previous Candidate: *(List year and candidate number.)*

**Information on Parent**

Name, Rank, Serial Number, Component and Branch of Service:

Organizational Address:

Retired or Deceased: *(Give date and attach copy of retirement orders or casualty report.)*

Officer Personnel: *(Attach Statement of Service prepared by personnel officer specifying all periods of active duty.)*

Enlisted Personnel: *(Attach statement prepared by personnel officer specifying all periods of active duty and listing date of enlistment, date of enlistment expiration, and branch of service.)*

Sincerely,

Signature



**FORMAT**  
**Request for Sons of Deceased or Disabled**  
**Veteran Nomination**

Date

Director of Admissions  
USAF Academy, Colorado 80840

Dear Sir:

I request a nomination under the Sons of Deceased or Disabled Veterans category for the class that enters the Academy in June 1969 and submit the following data:

Name: *(Print as shown on birth certificate. If different from that which you use, attach a copy of court order, if applicable.)*

Address: *(Give permanent and temporary addresses.)*

Date and Place of Birth: *(Spell out month.)*

Date of High School Graduation:

Social Security Number:

If Member of Military: *(List rank, serial number, Regular or Reserve component, branch of service, and organizational address including CMR or Box No.)*

If Previous Candidate: *(List year and candidate number.)*

**Information on Parent**

Name, Rank, Serial Number, Component and Branch of Service:

Date and Place of Death or Date and Place Disability Occurred:

Cause of Death or Cause of Disability: *(Forwarding a copy of death certificate, preferably the casualty report or copy of disability retirement order, will expedite processing of your application.)*

Veterans Administration XC Claim Number:

Address of VA Office Where Case Is Filed:

Sincerely,

Signature

## **FORMAT**

### **Request for Sons of Congressional Medal of Honor Nomination**

Date

Director of Admissions

USAF Academy, Colorado 80840

Dear Sir:

I request a nomination under the Sons of Congressional Medal of Honor Winner category for the class that enters the Academy in June 1969. The following data are submitted:

Name: *(Print as shown on birth certificate. If different from the one you use, attach a copy of court order, if applicable.)*

Address: *(Give permanent and temporary addresses.)*

Date and Place of Birth: *(Spell out month.)*

Date of High School Graduation:

Social Security Number:

If Member of Military: *(List rank, serial number, Regular or Reserve component, branch of service, and organizational address — including CMR or Box No.)*

If Previous Candidate: *(List year and candidate number.)*

#### **Information on Parent**

Name, Rank, Serial Number, Component and Branch of Service of parent to whom the Medal of Honor was awarded.

Sincerely,

Signature

## LIAISON OFFICER COORDINATORS

Liaison Officer Coordinators are Air Force Reserve Officers, not on active duty, who act as admissions counselors for the Air Force Academy. Anyone interested in receiving counseling assistance should write or call the nearest Liaison Officer Coordinator.

### ALABAMA

**Lt. Col. Max V. Gilmer**  
1740 Qxmoor Rd.  
Homewood, Ala. 35209

**Maj. Jason N. Kutack**  
Hancock Road  
Fairhope, Ala. 36532

### ALASKA

**Maj. Stanley D. Constantine**  
P.O. Box 1480  
Sitka, Alaska 99836

### ARIZONA

**Maj. Dean E. Smith**  
P.O. Box 802  
Tempe, Arizona 85281

### ARKANSAS

**Lt. Col. Hugh E. Phelan**  
P.O. Box 186  
Donaldson, Ark. 71941

### CALIFORNIA

**Col. Harold A. Burroughs**  
10577 Kinnard Avenue  
Los Angeles, Calif. 90024

**Col. Thomas B. McCray**  
5611 Mezzanine Way  
Long Beach, Calif. 90808

**Lt. Col. James C. Boynton**  
4651 Emily Court  
Castro Valley, Calif. 94546

**Lt. Col. Robert L. Dodge**  
4734 College Avenue  
San Diego, Calif. 92115

**Lt. Col. William P. Gilson**  
1421 Oregon Drive  
Sacramento, Calif. 95822

**Lt. Col. Elmo F. Hayden**  
1014 Olive Avenue  
Menlo Park, Calif. 94025

**Lt. Col. James S. Ritter**  
3391 Mono Drive  
Riverside, Calif. 92506

**Lt. Col. Ernest F. Smith**  
1509 East Mendocino Street  
Altadena, Calif. 91001

**Lt. Col. Leonard L. Turoski**  
3613 Soranna Avenue  
Bakersfield, Calif. 93309

### COLORADO

**Col. Glenn H. Dorward**  
6572 E. Dakota Avenue  
Denver, Colo. 80222

### CONNECTICUT

**Lt. Col. Jack S. Cummings, Sr.**  
23 Prudence Drive  
Stamford, Conn. 06907

### DELAWARE

**Lt. Col. Maurice Schlenoff**  
5403 Gist Avenue  
Baltimore, Md. 21215

### DISTRICT OF COLUMBIA

(Washington, D.C., area and Northern Virginia)

**Col. Owen P. McDonald**  
9000 Linton Lane  
Alexandria, Virginia 22308

### FLORIDA

**Col. Guy T. Bagli**  
4506 Henderson Blvd.  
Tampa, Fla. 33609

**Lt. Col. Harry S. Pickering**  
417 N.W. 120 Street  
Miami, Florida 33168

**Lt. Col. Carl E. Reed**  
Box 10169  
Jacksonville, Fla. 32207

### GEORGIA

**Lt. Col. Thomas C. Brown, Jr.**  
550 South Hill Street  
Griffin, Ga. 30223

### HAWAII

**Col. Henry S. Lau**  
925 Fourteenth Avenue  
Honolulu, Hawaii 96816

### IDAHO

**Lt. Col. Charles C. Banks**  
2411 Washington Street  
Caldwell, Idaho 83605

### ILLINOIS

**Lt. Col. Rex D. Johnson**  
Oneida, Ill. 61467

**Lt. Col. John W. Wuethrich**  
651 S. Loomis St.  
Naperville, Ill. 60540

### INDIANA

**Col. Earl K. Sample**  
Box 74  
Bristol, Ind. 46507

**Col. John F. Wild III**  
4007 Washington Blvd.  
Indianapolis, Ind. 46205

### IOWA

**Lt. Col. Paul H. Hillman**  
RFD 2  
Essex, Iowa 51638

### KANSAS

**Maj. Donald Brock**  
5011 W. 57th Street  
Mission, Kansas 66205

**Maj. John P. Quinlan**  
208 East Locust  
Independence, Kansas 67301

### KENTUCKY

**Lt. Col. Walter H. McNeil**  
P.O. Box 2097  
Pikeville, Ky. 41501



**Lt. Col. Robert C. Morrow**  
725 South 21st Street  
Paducah, Ky. 42001

#### **LOUISIANA**

**Col. Vane T. Wilson**  
215 Amherst Drive  
Baton Rouge, La. 70808

**Lt. Col. Raymond D. Holder**  
6109 Horton Avenue  
Shreveport, La. 71105

#### **MAINE**

**Lt. Col. George S. Wemyss**  
Fortunes Rocks  
Biddleford, Maine 04005

#### **MARYLAND**

**Lt. Col. Maurice Schlenoff**  
5403 Gist Ave.  
Baltimore, Md. 21215

#### **MASSACHUSETTS**

**Lt. Col. James B. Mullin**  
50 Thomas Park  
S. Boston, Mass. 02127

**Lt. Col. Edward J. Sandy**  
21 Alquat Street  
Westfield, Mass. 01085

#### **MICHIGAN**

**Col. Edward F. Lundberg, Jr.**  
18755 Cambridge Blvd.  
Lathrup Village, Mich. 48075

**Col. Kermit D. McAlvey**  
Box 231  
Petoskey, Mich. 49770

#### **MINNESOTA**

**Lt. Col. William J. Kaczrowski**  
1031 Griffin Avenue  
Mahtomedi, Minn. 55115

#### **MISSISSIPPI**

**Lt. Col. John H. Gore**  
No. 5 Plaza Bldg.  
Columbus, Miss. 39701

#### **MISSOURI**

**Col. John A. Riffle**  
Box 1055  
Kansas City, Mo. 64141

**Lt. Col. Claude C. Renow, Jr.**  
9134 Saddlebrook  
St. Louis, Mo. 63126

#### **MONTANA**

**Col. Robert E. Englert**  
1405 Fourth Avenue N  
Great Falls, Mont. 59401

#### **NEBRASKA**

**Col. Douglas W. Jorn**  
1247 Pershing Road  
Hastings, Nebr. 68901

#### **NEVADA**

**Lt. Col. William G. Davidson**  
Steptoe Route  
McGill, Nev. 89318

#### **NEW HAMPSHIRE**

**Col. Arthur E. Bean, Jr.**  
9 Vernon Street  
Concord, N.H. 03301

#### **NEW JERSEY**

**Lt. Col. Anthony DeFranco**  
32 Bayard Place  
Newark, N.J. 07106

#### **NEW MEXICO**

**Lt. Col. Leonard S. Hartman**  
3016 Frontier Place, NE  
Albuquerque, N.M. 87106

#### **NEW YORK**

**Col. Alfred B. Hauft**  
57 Prospect Street  
Babylon, N.Y. 11702

**Col. Milton Seaman**  
122 East 42nd Street  
New York City, N.Y. 10017

**Col. Howard L. Shonting**  
147 North Ridge St.  
Port Chester, N. Y. 10573

**Lt. Col. Richard C. Baynes**  
906 Madison Street  
Rome, N.Y. 13440

**Lt. Col. Antonio M. DeAngelo**  
1670 Providence Ave.  
Schenectady, N.Y. 12309

**Lt. Col. Raymond J. Wienk**  
343 N. Street  
Arcade, N.Y. 14009

#### **NORTH CAROLINA**

**Col. Arthur M. Skibbe**  
1904 Marlwood Circle  
Charlotte, N.C. 28212

**Lt. Col. Vaughn O. Moore, Jr.**  
2203 Hardee Road  
Kinston, N. C. 28501

#### **NORTH DAKOTA**

**Lt. Col. Arnold B. Normann**  
79 Fourth Avenue N  
Wahpeton, N.D. 58075

#### **OHIO**

**Col. Robert O. Barker**  
103 Country Club Drive, DeVola  
Marietta, Ohio 45750

**Lt. Col. Dale K. Anderson**  
4725 Penridge Road  
Toledo, Ohio 43615

**Lt. Col. Albert E. Prudence**  
3566 West 147th Street  
Cleveland, Ohio 44111

**Lt. Col. William C. Raitt**  
2533 Ridgecliff Avenue  
Cincinnati, Ohio 45212

#### **OKLAHOMA**

**Col. Lloyd G. Neblett**  
3916 East 40th Street  
Tulsa, Okla. 74135

#### **OREGON**

**Col. Maurice E. Druhl**  
8444 SW Ernst Road  
Portland, Ore. 97225

## PENNSYLVANIA

**Col. Kenneth C. Banzhof**

Paradise Farm  
Swiftwater, Penn. 18370

**Col. William F. Etchberger**

1012 Walnut Street  
Lebanon, Penn. 17042

**Col. Robert F. Mattern**

Box 9, Oak St. MR, Sylvan Hills  
Hollidaysburg, Penn. 16648

**Lt. Col. John R. Finfrook**

14 Rowan Avenue  
Greensburg, Penn. 15601

**Lt. Col. L. Brower Pernet**

104 Germantown Pike  
Plymouth Meeting, Penn. 19462

## RHODE ISLAND

**Lt. Col. Morris Chorney**

20 Harris Avenue  
West Warwick, R.I. 02893

## SOUTH CAROLINA

**Lt. Col. Joseph M. Pearson**

4040 Trenholm Road  
Columbia, S.C. 29206

## SOUTH DAKOTA

**Lt. Col. Edward J. Brodsky**

Jackson Park  
Rapid City, S.D. 57701

## TENNESSEE

**Col. Laurance W. Frierson**

201 W. Brow Oval  
Lookout Mtn., Tenn. 37350

**Lt. Col. John K. Havener**

5116 Longacre  
Memphis, Tenn. 38128

## TEXAS

**Col. Floyd D. Boze**

Box 4340 — Texas Tech College  
Lubbock, Tex. 79409

**Col. William O. Carter, Jr.**

2058 Palm St. — Box 5212  
Abilene, Tex. 79605

**Col. Quinten S. Mathews**

7207 Northaven Road  
Dallas, Tex. 75230

**Lt. Col. Charles W. Reese**

6122 Doliver Street  
Houston, Tex. 77027

**Lt. Col. Lewis M. Spears**

2205 Hopi Trail  
Austin, Tex. 78703

## UTAH

**Col. Oliver R. Smith**

970 N. 12th East  
Provo, Utah 84601

## VERMONT

**Lt. Col. Edward J. Sandy**

21 Alquat Street  
Westfield, Mass. 01085

## VIRGINIA

**Lt. Col. George W. Chernault, Jr.**

P.O. Box 2161  
Roanoke, Va. 24009

**Lt. Col. Worth G. Kirkman**

113 Sherwood Drive  
Queens Lake  
Williamsburg, Va. 23185

## WASHINGTON

**Maj. Ted U. Hart**

507 West Main  
Walla Walla, Wash. 99362

**Capt. James S. Keck**

10101 SE 30th St.  
Bellevue, Wash. 98004

## WEST VIRGINIA

**Lt. Col. Walter H. McNeil**

P.O. Box 1230  
Williamson, W. Va. 25661

## WISCONSIN

**Maj. Walter D. Oliver**

961 Ninth Street  
Menasha, Wis. 54952

## WYOMING

**Lt. Col. John D. Fradet**

1363 Woodworth St.  
Sheridan, Wyo. 82801

Academy Liaison Officers on active duty visit the Cadet Chapel



# Preparation



An Academy Liaison Officer counsels a high school student

## PREPARATION GUIDE

It is important to prepare for the Academy well in advance of admission. Academic, leadership and physical preparation may even begin on the junior high school level. In senior high, a young man is definitely advised to follow the program of preparation outlined in this chapter.

A student preparing for the Academy should be diligent in his effort to obtain the proper background. He should learn how to study effectively and budget his time to an advantage, for this is expected of every cadet at the Academy. To be successful, a cadet must give maximum effort to the Academy curriculum of academic studies, military training, and physical education.

High school counselors and Air Force Academy Liaison Officers may provide helpful assistance to individual students with a specific program of preparation.



One of the most important things for a young man to know is *when* to apply for the Academy. If he wants to enter immediately after graduation from high school, as most cadets do, he must apply well in advance. It is advisable to apply for a Congressional nomination during the spring of his junior year. Members of Congress nominate their candidates from June through January for the cadet class entering the following June. Young men who apply early usually stand a better chance of receiving a nomination.

If a student was not successful in obtaining an appointment to enter in June following his high school graduation, he may try for the Academy class entering the following year. The Academy encourages prospective candidates to attend a preparatory school or a civilian college or university during the intervening year.

### **Academic Preparation**

The College Board tests, required for admission to the Academy, measure a candidate's potential for success in the cadet academic program. For adequate academic preparation in high school, a young man should definitely take the following subjects and strive for above average grades in his class work:

#### *Intermediate Mathematics — 4 units*

(Should include first-year algebra, intermediate algebra, trigonometry, and plane geometry.)

#### *English — 4 units*

The following subject areas are recommended as an additional background for the academic program. A prospective candidate should try to take as many courses as possible which embrace these areas in the sciences, social sciences, and humanities.

##### *Sciences*

Biology

Chemistry

Physics

General Science

Advanced Mathematics

Mechanical Drawing

##### *Social Sciences and Humanities*

Economics

American Government

History

Geography

Psychology

Foreign Languages

Public Speaking

Typing is recommended in addition to the above courses. Typewriters are available to the cadets for preparing reports.

Each cadet at the Academy is required to take one foreign language, either German, Chinese, Spanish, French or Russian. A high school background in one of these languages is helpful. The

student who has an opportunity to take a language in high school should select one language and take as many years of instruction in it as possible. Three years of instruction are considered desirable for the best preparation. Either Russian or German is appropriate for cadets who may desire to major in the sciences.

The Academy does not require specific school courses or credits for entrance. A candidate does not have to be a high school graduate to gain admittance. However, one who has not graduated from high school at the time of admission may lack the proper background to accomplish the cadet program of education.

A high school student preparing for the Academy must rank in the upper forty percent of his high school class in grade average or he will not qualify for admission to the Academy without further preparation in college or preparatory school. The Academy does not attempt to recommend specific schools for preparation. Any accredited institution of higher education which offers a broad curriculum in the sciences and liberal arts should provide adequate preparation for the Academy.

College credits may be transferred to the Academy if the courses correspond to those in the cadet curriculum and an acceptable grade level has been achieved. Cadets who have successfully completed college-level high school courses, or those who have acquired extensive knowledge of a subject without taking a course, may take validation examinations after admission in an effort to obtain credit for comparable Academy prescribed courses. Validation examinations are required of each new cadet in the subjects of chemistry and mathematics. They are given on an optional basis in other subjects prescribed for the Fourth Class (freshman) year.

Cadets who have made high scores on College Board advanced placement tests may receive validation credit for comparable Academy courses without taking the validation examinations. Young men preparing for the Academy are especially encouraged to take advanced placement tests in Composition and Literature, United States History, and History of Modern Europe prior to coming to the Academy.<sup>1</sup>

A cadet who demonstrates acceptable achievement in a subject through college transfer credit or validation examination will be allowed to complete the comparable Academy course at an accelerated rate or to omit the course and take an appropriate

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<sup>1</sup>The advanced placement tests are administered in May of each year at College Board examining centers throughout the country. Registration in advance, including payment of fee, is necessary. Information on registration procedures, fees, testing dates, and examining centers is contained in the bulletin, *Advanced Placement Examinations*, available without charge. This bulletin may be obtained by writing to the College Board Advanced Placement Examinations at one of the following addresses: Box 592, Princeton, N. J. 08540, or Box 1025, Berkeley, Calif. 94701.

substitute. No matter how many courses a cadet may validate or transfer, he must enter as a Fourth Classman and spend four years at the Academy.

Students preparing for the Academy should plan to transfer credit or validate courses whenever possible. Cadets who have done so will be able to complete their prescribed courses sooner, thus leaving more time in their schedule to gain depth in a subject area or prepare for post-graduate study. Many Academy graduates will have opportunities for advanced study at civilian universities or Air Force technical schools.

While not specifically excluding appointment to the Academy, young men interested in the study of medicine should be aware that the curriculum is not designed to prepare a student for the medical profession. Those who desire to enter the professions of dentistry, law or theology should not apply for appointment.

### **Leadership Preparation**

All phases of the Academy curriculum are devoted to preparing the cadet for leadership in the Air Force. Active participation in high school extracurricular activities provides valuable experience in preparing for positions of leadership responsibility.

A young man preparing for the Academy should participate in extracurricular activities, both athletic and non-athletic, to demonstrate his leadership potential. The Academy considers a candidate's potential to be greater through distinction in extracurricular activities, such as being elected class president or earning an athletic letter award, than by joining in a variety of activities without evidence of leadership. The Academy considers the following to be evidence of leadership potential:

1. President or vice president of school classes or student government.
2. Participation and achievement in athletics (football, baseball, basketball, track and others).
3. Meritorious awards in academic or leadership activities (Citizenship Award, Outstanding Student Award, Boys State Delegate, National Merit Scholarship Recognition).
4. Participation and achievement in public speaking, publications or musical activities.
5. Participation and achievement in the Eagle Scouts, Civil Air Patrol, or Reserve Officer Training Corps.

### **Physical Preparation**

All young men who are preparing for the Academy should maintain a high degree of physical fitness through participation in sports and through proper care of health. There is a definite cor-



relation between physical fitness and the ability to succeed in the cadet program of education and leadership training.

A physical aptitude examination is given to each candidate to measure his coordination, strength, endurance and agility. Candidates may prepare for this examination by engaging regularly in vigorous physical activity such as running, exercises and sports.

A cadet's first two months at the Academy are devoted to a strenuous physical program of basic cadet training. Physical exertion is required from morning until night as the cadet goes through physical conditioning and military training. A basic cadet must be conditioned to meet the stringent physical demands that will be placed upon him. It is recommended that a candidate prepare in advance and build up his physical endurance through the following activities:

1. Participate in vigorous athletic team sports such as baseball, basketball or football.
2. Participate in individual sports requiring sustained physical effort such as swimming, playing tennis, handball or squash. It is advisable for a young man to learn how to swim before he enters the Academy.
3. Practice strenuous conditioning exercises until many repetitions of each exercise can be accomplished without undue physical strain. Push-ups, pull-ups, sit-ups and other exercises are recommended emphasizing development of legs, arm and shoulder strength.
4. Sustained distance running should be included in a daily workout program. One mile runs are recommended, with alternate running and walking at first and gradually increasing the amount of running.

## **PREPARATORY SCHOLARSHIPS**

Three non-profit agencies, the Falcon Foundation, the Gertrude Skelly Trust, and the General Henry H. Arnold Educational Fund, provide educational assistance programs to enable deserving young men to better qualify for admission to the Air Force Academy. These agencies have no official connection with the United States Air Force or the Air Force Academy. Neither do they have any connection with the Air Force Academy Foundation which raises funds to provide recreational and cultural facilities for the Academy.

### **The Falcon Foundation**

The Falcon Foundation provides preparatory scholarships annually for highly motivated and qualified young men seeking admission to the Academy and a lifetime career in the Air Force. The scholarships are awarded through preparatory schools to deserving young men who need additional academic preparation.

The Foundation makes annual cash grants for these scholarships to specific preparatory schools in various parts of the nation.

Application for scholarships and information concerning the schools must be made directly to the Falcon Foundation, Post Office Box 611, Dallas, Texas 75206. Completed applications must be received by the Foundation by 1 May each year.

### **The Gertrude Skelly Trust**

The late Gertrude Skelly of Tulsa, Oklahoma, wife of William G. Skelly, founder of the Skelly Oil Company, established this trust fund. It is administered by two Trustees: Mr. Harold C. Stuart, president of KVOO Radio and Television and former Assistant Secretary of the Air Force, and Mr. Russell F. Hunt, Executive Vice Chairman of the Board of Directors of the First National Bank and Trust Company, Tulsa.

Scholarships from this trust fund will be awarded only to sons, adopted sons or step-sons of active, retired, or deceased career members of the armed forces of the United States. A young man should not apply unless his father was or is a career member of the armed forces.

The applicant may indicate his choice of preparatory school, either on the high school or college level. He must apply for financial assistance before 1 May to enter school in September. Complete information on applications may be obtained by writing to The Gertrude Skelly Trust Fund, Box 1349, Tulsa, Oklahoma 74101.

### **The General Henry H. Arnold Educational Fund**

Sponsored by the Air Force Aid Society, this fund provides educational assistance to sons of Air Force personnel. Consideration is given, first, to sons of deceased Air Force and Army Air Corps personnel who died on active duty or in retired status and, second, to sons of other Air Force personnel.

Assistance is limited to college and preparatory schools beyond the high school level. The applicant may make his own choice of an accredited school. An application blank may be requested from: Director, Air Force Aid Society, National Headquarters, Washington, D.C. 20333. An application blank is not available at Aid Society sections on Air Force installations. The completed application, including qualifications and need for financial assistance, must be returned to the Air Force Aid Society not later than 31 January preceding the fall of the year the applicant plans to enter college or preparatory school.

# The Academy Preparatory School



An Air Force Academy Preparatory School is conducted for selected members of the Regular and Reserve components of the Air Force and for other eligible military nominees. Its purpose is to provide intensive instruction in English and mathematics to assist servicemen in preparing for the Academy entrance examinations. It also prepares servicemen for the academic, military and physical training programs of the Academy. The school begins in July and continues through May.

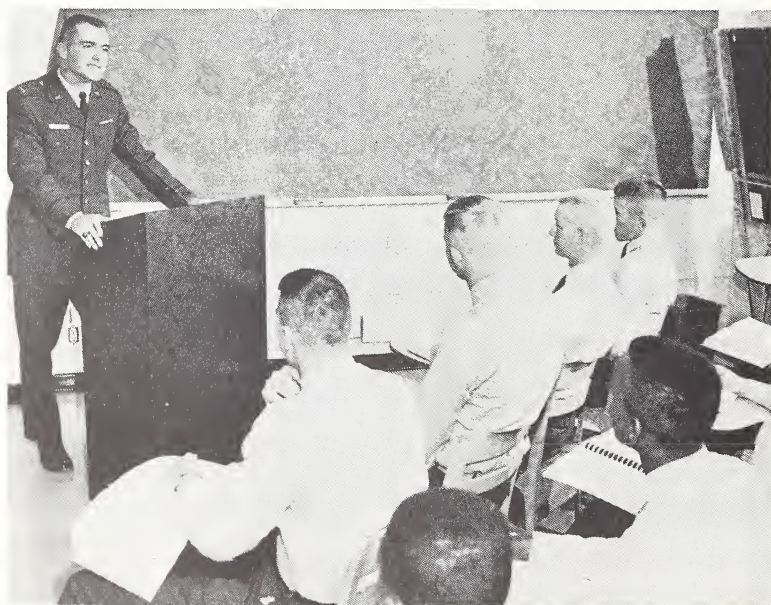
A member of any one of the armed services on extended active duty may apply for the Preparatory School through his unit commander. Details of application and eligibility are outlined in a joint Air Force, Navy and Marine Corps regulation entitled "Air Force Academy Preparatory School." (Specific regulation numbers are AFR 53-14, BUPERS INST. 1530.49B, and MCO 1530.5A.) A request for assignment to Preparatory School may be submitted after 1 September of the year preceding entry to the school. The application period closes on 31 May.



To apply for an appointment to the Preparatory School, members of the Army, Navy, and Marine Corps must be on active duty and have received a nomination from a Member of Congress or other authorized nominating authority, or else be eligible to make application in one of the service connected categories other than those for Air Force Regular or Reserve airmen. Members of the other services are not eligible for nomination to the Academy under the Regular or Reserve categories.

Members of the Air Force Reserve and Air National Guard not on extended active duty are eligible for nomination under the Reserve component and may make application for Preparatory School. Applications should reach the Director of Admissions before 31 May. Air National Guardsmen who are selected must then be enlisted in the Air Force Reserve. From Reserve status, candidates will be called to extended active duty to attend the Preparatory School. Those who have not received basic training will be sent to Lackland Air Force Base, Texas, for this purpose.

Civilian candidates who were qualified for the Academy, but were not offered an appointment in the previous cadet class, may have an opportunity to attend the Academy Preparatory School as members of the Air Force Reserve. Those qualified candidates who may improve their chances in the Academy competition by further academic preparation will be informed of the opportunity to compete for a Preparatory School assignment by the Academy Director of Admissions. Any other previous candidate who is interested in being considered for assignment to the Preparatory







School may write to the Director of Admissions. Civilian candidates must be willing to join the Air Force Reserve for six years if selected to attend the school.

Selection of students for the Preparatory School is accomplished by the Air Force Academy. Selection is based on the applicant's high school academic record, his extracurricular activities, the recommendation of his commanding officer, and the results of mental and medical examinations. *Selection for the Preparatory School, or completion of the course, in no way guarantees the student an appointment to the Academy.* The Preparatory School student must follow the same procedure for obtaining a nomination and competing for an appointment as any other member of the Regular or Reserve components.

Complete information concerning the Preparatory School is contained in a brochure available upon request from the Registrar, USAF Academy, Colorado 80840.

# SUMMARY OF THE CORE CURRICULUM

In Semester Hours

## FOR THE CLASS OF 1972

### 4th Class — Freshman

	<i>Summer</i>
Mil Tng 100	5
Phy Ed 110	2
	<hr/> 7
	<i>Fall &amp; Spring</i>
Chem 101-102	5½
Engl 111-112	5½
Geog 120	2½
Hist 101-104	5½
Instr Tech 101-102	0
Math 101-102	13½
Psych 100	2½
Cmd Tng 101	1½
Mil Tng 115-116	1
Phy Ed 104	¼
Phy Ed 105-106	2
Phy Ed 120	1
	<hr/> 40¾

### 2nd Class — Junior

	<i>Summer</i>
Mil Tng 300	4
	<i>Fall &amp; Spring</i>
Aero 331-332	5½
El Engr 333-334	5½
For Lang I-II	9
Law 304	1
Psych 302	2½
Cmd Tng 301	1½
Mil Tng 320	1
Armshp 370	½
Phy Ed 305-306	2
Phy Ed 320	1
	<hr/> 29½

### 3rd Class — Sophomore

	<i>Summer</i>
Mil Tng 200	4½
	<i>Fall &amp; Spring</i>
Comp Sci 230 or 240 or 254	2½
Econ 200	5
Hist 203-204	5½
Law 200	2½
Life Sci 210	2½
Math 201-202	5½
Mech 120	2½
Philos 210	1
Phys 220	5
Pol Sci 211-212	5½
Soc 304	½
Cmd Tng 201	1½
Mil Tng 220	1
Phy Ed 205-206	2
Phy Ed 220	1
	<hr/> 43½

### 1st Class — Senior

	<i>Summer</i>
Mil Tng 400	5
	<i>Fall &amp; Spring</i>
Astro 432	2½
Engl 430 or 450	2½
Hum 406	3
Law 402	½
Cmd Tng 401	1½
Phy Ed 404	¼
Phy Ed 405-406	2
Phy Ed 420	1
	<hr/> 13¼

# The Academy Curriculum

The Academy curriculum provides four years of academic education in the basic and engineering sciences, social sciences and humanities. The curriculum also includes four years of military instruction, command training and physical education.

## The Core Curriculum

The curriculum is based on "core" courses which prepare the cadet for a broad scope of activity as an Air Force officer. Core courses for the basic education of all cadets total  $147\frac{1}{2}$  semester hours, divided among the areas of instruction as follows: academic program — 105; command and military training — 28; physical education and athletics —  $14\frac{1}{2}$ . In addition to the core curriculum each cadet must complete approximately  $40\frac{1}{2}$  semester hours to earn an academic major in an area or subject of his interest. This brings the total curriculum requirement to 188 semester hours.

Most cadets take only core curriculum courses during their first four semesters at the Academy. Since some of them are part of two-, three-, and four-course series, two standard core sequences are used for Fourth and Third Class years in order to balance enrollments between fall and spring semesters. Which sequence a cadet follows depends on his first mathematics course. His placement in mathematics depends on his scores on entrance and placement examinations, previous background and individual desires.

Every cadet is required to complete a six-semester-hour mathematics course during the fall semester of his Fourth Class year. If he passes Math 101 or 131, he then follows the sequence for basic and intermediate mathematics students. If he passes Math 161 or a higher numbered course, he follows the sequence for advanced mathematics students. Because of their diverse backgrounds, few cadets will follow the standard sequences exactly. Those who receive transfer credit, validation credit or who take accelerated courses will find they can move some core courses to an earlier semester. Cadets who have difficulty in an advanced mathematics course may be transferred to a lower-numbered course and thereby change sequences.

Once a cadet chooses a major, he begins to take courses required for his major along with the remaining core courses. He and his faculty advisor plan his program to best serve his needs while still meeting the core and major's requirements.



The standard core sequences for the Class of 1972 are as follows:

#### **Class of 1972**

Basic and Intermediate Mathematics — First Course: Math 101 or 131

1	2	3	4
Chem 101	Chem 102	Econ 200	Phys 220
Engl 111	Engl 112	Mech 120	Law 200
Hist 101	Hist 104	Hist 203	Hist 204
Geog 120	Psych 100	Pol Sci 211	Pol Sci 212
Math 101-131	Math 102-132	Life Sci 210	Comp Sci
		Math 201-231	Math 202/Elective <sup>1</sup>
			Philos 210
			Soc 304

Advanced Mathematics — First Course: Math 161 or higher

1	2	3	4
Chem 101	Chem 102	Phys 220	Econ 200
Engl 111	Mech 120	Comp Sci	Life Sci 210
Hist 101	Hist 104	Hist 203	Hist 204
Psych 100	Geog 120	Pol Sci 211	Pol Sci 212
Math 161	Math 162	Law 200	Engl 112A
		Elective <sup>2</sup>	Elective <sup>2</sup>
			Philos 210
			Soc 304

Cadets who have not chosen a major by the time they register for their course in computer sciences should take Comp Sci 254 if they are interested in science and engineering, Comp Sci 240 if interested in the social sciences, or Comp Sci 230 if interested in the humanities.

### **Academic Majors**

The requirement for each cadet to complete an academic major was instituted at the Academy in 1964. This change culminated a series of curriculum innovations that began in 1957 with the Enrichment Program. The program broadened the field of study open to a cadet. It gave him the opportunity to take elective courses beyond the prescribed curriculum and to concentrate in a major area of his interest. It allowed him to transfer credit or validate previous college-level courses he may have had.

Cadets responded to the Enrichment Program with enthusiastic participation. More than three-fourths of the cadets participated each semester. The response indicated that most cadets desire to specialize in a subject and to pursue academic excellence.

In order to permit all cadets to complete a major at the Academy, the curriculum was revised to allow for the accomplishment

<sup>1</sup>Math 234 required in winter term; major's course, core course or option in the spring semester.

<sup>2</sup>Major's course, core course, or option.

of a subject-area major within the prescribed requirement. Enrichment departmental majors were continued for cadets who have the ability to complete overload courses. Cadets may complete more than one major, or a major and a complementary minor.

The following majors and minors are offered:

**Majors**

Aeronautical Engineering	General Studies
American Studies	Geography
Astronautics	History
Basic Sciences	Humanities
Chemistry	International Affairs
Civil Engineering	Latin American Studies
Computer Science	Life Sciences
Economics	Mathematics
Electrical Engineering	Military Art and Science
Engineering Management	Physics
Engineering Mechanics	Political Science
Engineering Sciences	Psychology
Far Eastern Studies	Soviet Studies
General Engineering	Western European Studies

**Minor**

Atmospheric Science (with Basic Sciences major)

Each year during April the faculty advisors explain the purpose and requirements for their majors at a series of meetings held on Sunday evenings. A cadet may go to as many as four meetings. If he wishes, he may have more interviews with advisors in areas which interest him. Until he chooses a major, a cadet may seek advice from any faculty advisor. A firm choice must be made before registration for fall semester of Second Class (junior) year. Most cadets, especially those who select science and engineering majors, will choose earlier. At the time he chooses a major, a cadet is assigned a faculty advisor with whom he plans his course program each semester.

**Cooperative Graduate Programs**

The Academy curriculum also includes graduate-level courses which may be applied toward a master's degree. Under cooperative arrangements between the Academy and certain civilian universities, selected cadets may earn master's degrees from these universities in less than one year after their graduation from the Academy. Such graduate programs are available at present in Astronautics, Economics, History, International Affairs, Management, Applied Mathematics, and Physics.

Cadets selected to attend the civilian universities must complete the requirements of a prerequisite undergraduate major and the equivalent of one-half year of graduate-level course work during

their Second and First Class years at the Academy. Cadets who perform in an outstanding manner in their major will be considered for participation in the cooperative programs. All participants who are physically qualified will be given the opportunity to enter flying training after they have completed their master's degree.

### **The Enrichment Program**

Through the Enrichment Program, cadets may be placed in courses according to their individual ability, preparation and achievement. Cadets are encouraged to participate in this program in any or all of the following ways:

#### **Transfer Credit**

Credit may be awarded for any college course satisfactorily completed which is equivalent to a course in the Academy curriculum. This allows cadets to substitute other courses for those omitted through transfer credit.

#### **Validation**

Special competence may have been gained through "honors" courses in high school, through College Board advanced placement courses or other experience that will enable cadets to complete validation examinations to satisfy the requirements for comparable Academy courses. The cadet may choose a substitute elective for a course satisfactorily validated.

#### **Acceleration**

Cadets who have special preparation or above average ability may be placed in accelerated courses which complete the requirements for a two-course sequence in one semester. Such courses are currently offered in chemistry and mathematics.

#### **Substitution**

Advanced course versions are offered as substitutes for some of the prescribed courses. They allow a cadet to concentrate on a subject in greater depth or to satisfy requirements for a major.

#### **Overload**

Cadets who maintain a 2.60 grade point average may enroll in one course beyond the normal semester requirement. This allows the student to have a wider latitude in his course selection.

### **Accreditation**

The Air Force Academy is a fully accredited institution of higher learning. The standard Bachelor of Science degree is accredited by the North Central Association of Colleges and Secondary Schools. The Engineers' Council for Professional Development, composed of representatives of the major professional engineering societies, has granted accreditation to the majors in Aeronautical Engineering, Civil Engineering, Electrical Engineering, Engineering Mechanics and Engineering Sciences. The Major in Chemistry is accredited by the American Chemical Society. Cadets who complete the requirements for one of these majors will earn a specified

degree: for example, Bachelor of Science in Chemistry. Although a cadet may earn more than one major, he is awarded only one degree and one diploma.

### **Testing and Grading**

Various departments of the faculty use a variety of testing techniques, ranging from essay questions and themes to short-answer and multiple-choice items. The nature of the subject matter determines the type of test used.

Quizzes are given over class materials at the discretion of the individual instructor. Most departments permit the instructor to construct tests for their own classes so that a portion of the final grade will come from measuring instruments devised with total freedom by the instructor. In preparing graded reviews and final examinations, most departments use a committee composed of several instructors.

The quality of a cadet's performance in any academic course is reported by means of letter grades. These grades denote character of work and are assigned grade points as follows:

<i>Grade</i>	<i>Character</i>	<i>Grade Points Per Semester Hour</i>
A	Excellent	4
B	Good	3
C	Satisfactory	2
D	Passing	1
F	Failing	0

Cadets are graded frequently on daily recitations, general reviews, and assignments prepared outside of class. For each 50-minute class period, the cadet is expected to devote 90 minutes to outside preparation. He may be called upon to participate and recite any time he is in class.

Progress reports are published regularly during the semester to inform cadets of their grades. Grade reports are published at the end of each semester by the Office of Cadet Records.

### **Cadet Achievement**

Cadets are recognized for achievement in academic courses, military performance, and athletic participation as follows:

1. Cadets who excel in academic courses are placed on the Dean's list at the end of each fall and spring semester. The list consists of cadets whose grade-point average is at least 3.0.
2. Cadets who excel in military performance are placed on the Commandant's List at the end of each fall and spring semester. The list consists of the top 33 $\frac{1}{3}$ % in each class who have demonstrated the greatest cadet effectiveness.
3. Cadets who are on both the Dean's and Commandant's Lists are carried on the Superintendent's List denoting excellence in both academics and military performance.



Cadets whose names appear on either of these lists are granted additional privileges according to their class. They are recognized for this distinction by an insignia on the left breast pocket of the uniform. Cadets on the Dean's List wear a small silver star, those on the Commandant's List wear a silver wreath, and those on the Superintendent's List wear a silver star enclosed in a silver wreath.

Athletic awards are presented at the annual awards banquet during June Week. Individual and team trophies are given to winners of intramural competition. Cadets receive letters and numerals to be worn on athletic jackets for their participation and achievement in intercollegiate competition. Special awards are given for outstanding performance in varsity sports.

### **Deficiency and Dismissal**

A cadet will be placed on academic probation if at any grade report he has a current or cumulative grade-point average below 2.0 (C grade), or has an F or I grade in one or more courses. He will be counseled by faculty members and given the opportunity for extra instruction.

A cadet who fails a course or has a below minimum grade-point average at the end of a semester is reported to the Academy Board for consideration of his case. Cases reported to the Academy Board usually receive one of the following recommendations: a specified probation period, turn-back to the next succeeding class, required to take a summer program or dismissed from the Academy. Other cases coming before the Board are deficiencies in conduct (demerits) or in aptitude for commissioned service.

### **Graduation Requirements**

To graduate from the Air Force Academy a cadet must demonstrate an aptitude for commissioned service and leadership, be satisfactory in conduct, and be proficient in physical education and military training. He must complete the requirements for the core curriculum and for an academic major, passing all courses (or equivalents) for the core and for the major. He must meet a minimum standard of a cumulative overall grade-point average of 2.0 (C) and a cumulative grade-point average of 2.0 in his major. For the Class of 1972 the core and minimum major's requirements amount to fifty-three course units. (*Course units are used in place of semester hours to determine a cadet's normal load for each semester.*)

## **The Faculty**

The Academy maintains an all-military faculty whose members are qualified to educate the cadets for professional Air Force careers. Faculty members are required to earn master's degrees in their fields and many of them obtain doctorates. A number of colleges and universities in the United States, as well as some foreign institutions of higher education, are represented in the backgrounds of the Academy faculty.

The faculty is composed primarily of Air Force officers. A few officers from the United States Army, Navy, and Marine Corps, and from military forces of allied nations serve in a liaison capacity. A list of the names of faculty members, their academic rank and degrees precedes the course descriptions for each department of the faculty.

Twenty-one permanent professor positions, including the Dean of the Faculty, have been established by law. The permanent professors usually serve as department heads. The other academic ranks are tenure associate professor (on extended tours of duty), associate professor, assistant professor and instructor.

Members of the Academy faculty have a responsibility beyond that of teaching their particular courses. They have an obligation to help furnish a continuing motivation for cadets to devote a life career to the service of their country. They attempt to accomplish this goal through precept and example as career officers and qualified faculty members. In addition to maintaining close contact with the cadets in the classrooms and as course directors, faculty members serve as sponsors for their extracurricular activities.

Faculty members perform other functions such as participating in local and national meetings of educational and professional societies. Many of them have made contributions to the literature of their disciplines and to progress in their fields through research projects. During summer months, faculty members often serve other installations of the Air Force as consultants.

## **Instruction**

Faculty members may employ the entire range of teaching techniques including lectures, discussions, demonstrations, tutorials and seminars. The small size of most Academy classes (usually 12 to 18 cadets) has made the discussion approach practical and popular. The classroom atmosphere is relaxed with free communica-

tion between the instructor and cadets. Extra instruction is provided for cadets who need assistance to improve their understanding of a subject.

Individual initiative is encouraged in all aspects of the curriculum. A course entitled Independent Study, consisting of research work by the cadet on a topic of his own choosing, is offered to First Classmen by each academic department. Term papers and laboratory experiments provide other opportunities for cadets to engage in their own research.

Academy prepared readings, notebooks, and laboratory guides as well as commercially published materials are used by the academic departments. Daily assignments, supplementary reading suggestions, and discussion questions are included in most of the materials.

Classroom teaching aids supplement assigned course materials in all departments. The most modern techniques and equipment are available to all instructors. Among these are mock-ups and various graphic materials manufactured at the Academy, an extensive library of films and slides, and the facilities of closed circuit television.

The television system reaches every teaching area in the academic complex. Academic departments use the TV medium primarily as a supplement to live instruction in the classroom. An academic skills course in reading improvement and typing, a non-credit requirement of all Fourth Class cadets, is taught mainly by televised presentations.

All academic and military training departments sponsor guest lecturers to supplement classroom instruction. Noted guests from throughout the United States and several foreign countries have made presentations to the cadets to highlight various aspects of their education.

### **Semester Schedule**

The yearly calendar of the Air Force Academy is based on Graduation Day. By agreement among the service academies, graduation has been established as the 40th Wednesday after Labor Day, making it fall from 3 to 9 June. The academic year begins the day after graduation. It is divided into three sessions: a summer term, a fall semester, and a spring semester.

The summer term is ordinarily ten weeks long. The new cadet class enters the Academy on the tenth Monday preceding Labor Day (falling from 23 to 29 June).

The basic cadet summer training schedule consists of four days of processing followed by a seven-week training period in which cadets of the First Class instruct the new cadets in military and physical training. The Third and Second Classes go on field trips and volunteer for flight training programs during the summer term. All cadets except the new class receive a leave during the summer. A transition period of four days follows the summer term for all classes.

The fall semester begins on the third Sunday before Labor Day (from 17 to 23 August) and ends when Christmas leave begins. The fall semester contains between 17 and 18 weeks of instruction. The spring semester begins at the end of the Christmas leave period and ends on the Saturday before Graduation. It contains between 21 and 22 weeks of instruction.

The spring semester begins with a winter term of 16 class days. The  $\frac{1}{2}$  and 1 semester hour core curriculum courses (e.g. Law 304) are taught during this period. Each semester includes a final examination period of five days.

The academic week in the fall and spring semesters consists of five days, Monday through Friday, with seven 50-minute class periods, and a half-day on Saturday with five 45 minute periods. The weekdays are utilized for regular classes and Saturday mornings for parades and other events of the Cadet Wing.

### **Course Numbers and Course Descriptions**

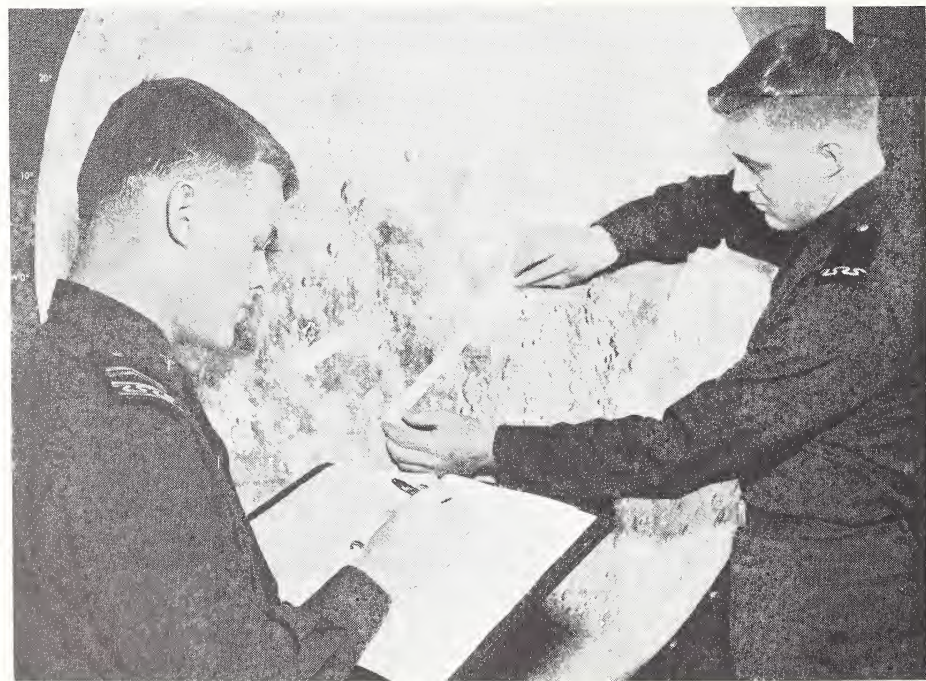
Descriptions of the courses to be offered during the academic year 1968-1969 are found in the next section of this catalog. Course numbers have a general meaning. The first digit of a course number indicates the class year for which the course is designed: 100 series for the Fourth Class year; 200 series the Third Class year; 300 series the Second Class year; and 400 series the First Class year. The 500 series indicates graduate-level courses.

Following the description of each course is a code such as 1 (E101). The number before the parentheses is the course unit value which is used to determine a cadet's course load for a semester. The symbols within the parentheses comprise the course identifier which is used in the automated data processing system.

Final examination or final report requirements, course pre-requisites and semester hours are shown at the end of each course description. A number of academic courses are offered in both the fall and spring semesters. In some courses, the credit awarded may be  $\frac{1}{2}$  semester hour greater for the longer spring semester than for the fall.



# The Academic Program



**Brig. Gen. Robert F. McDermott**  
***Dean of the Faculty***  
***Permanent Professor***

B.S., United States Military Academy; M.B.A.,  
Harvard University; LL.D., Saint Louis  
University; Litt.D., Saint Bernard College



- COL. WILLIAM T. WOODYARD, *Vice Dean of the Faculty* — B.S., A.M., University of Missouri; Ph.D., University of Denver
- COL. ALFONSE R. MIELE, *Assistant Dean and Faculty Executive* — A.B., Fordham College; M.A., Ph.D., Columbia University; Palmes Académiques
- LT. COL. MICHAEL J. MENDELSON, *Assistant Dean for Graduate Programs* — B.A., University of Pittsburgh; M.A., Trinity University; Ph.D., University of Colorado
- LT. COL. THOMAS D. WADE, *Director of Faculty Administration* — A.B., M.Litt., University of Pittsburgh
- MAJ. WILLIAM E. ALBRIGHT, JR., *Special Assistant to the Dean* — B.S., United States Military Academy; M.A., Graduate Institute of International Studies, Geneva, Switzerland
- CAPT. CHARLES F. STEBBINS, *Special Assistant to the Dean* — B.S., United States Air Force Academy; M.S.A.E., California Institute of Technology; Ph.D., University of Colorado
- CAPT. ERIC M. SOLANDER, *Aide to the Dean* — B.A., San Jose State College

## **COURSES OF STUDY**

The academic program provides a general undergraduate education with an academic major for each cadet in a particular field. Enrichment courses at the undergraduate and graduate levels are offered to challenge cadets to advance beyond the prescribed program. The academic courses of study are conducted by departments within four major divisions under the Dean of the Faculty: Basic Sciences, Engineering Sciences, Humanities, and Social Sciences.

### **DIVISION OF BASIC SCIENCES**

The Division of Basic Sciences offers courses in chemistry, life science, mathematics, physics and atmospheric science. The cadet develops knowledge and skills in basic subjects which are necessary to an understanding of science in the modern world, with particular attention to the background needed for an Air Force

career. Laboratory work develops the scientific method of obtaining results through accurate observation, critical thinking, and logical reasoning.

Through the completion of selected courses offered by the division a cadet may obtain a Major in Basic Sciences, Chemistry, Life Sciences, Mathematics, or Physics, or a minor in Atmospheric Science. These majors and minors are recommended for cadets who contemplate future graduate work in chemistry, mathematics, meteorology, physiology, medicine, or physics. A Cooperative Master's Degree Program in Applied Mathematics and in Physics is offered to cadets who are outstanding in the basic sciences.

## **Department of Chemistry**

### ***Permanent Professor and Head of the Department; Chairman of the Basic Sciences Division***

COL. WILLIAM T. WOODYARD (*now serving as Vice Dean of the Faculty*) — B.S., A.M., University of Missouri; Ph.D., University of Denver

### ***Professor and Acting Head of the Department***

LT. COL. CHARLES K. ARPKE — A.B., M.A., Ph.D., University of Nebraska

### ***Tenure Associate Professors***

LT. COL. JAMES E. BANKS — B.S., M.S., Ph.D., Stanford University

MAJ. LOWELL A. KING — B.S., Iowa State University; A.M., Washington University; Ph.D., Iowa State University

CAPT. DAVID W. SEEGMILLER — B.S., M.S., Brigham Young University; Ph.D., University of California at Berkeley

### ***Associate Professors***

LT. COL. JOHN R. COMERFORD, JR. — B.S., Virginia Military Institute; M.Sc., Ph.D., Ohio State University

LT. COL. ALFRED D. NORTON — B.S., United States Military Academy; B.S., University of Washington; M.S., University of Tennessee

MAJ. GEORGE D. BRABSON — B.S., Case Institute of Technology; M.S., Ph.D., University of California at Berkeley

MAJ. JOHN I. RIGGS, JR. — B.S., University of Missouri; Ph.D., Baylor University

### ***Assistant Professors***

MAJ. DONALD M. BURKE — B.S., Capital University; M.S., Ohio State University

MAJ. ALFRED D. BROWN, JR. — B.S., M.S., Ph.D., Auburn University

MAJ. RALPH W. BURNS, JR. — B.S., Colorado State University; M.S., Ohio State University

MAJ. VINCENT D. CALBI — B.S., Queens College, New York; M.S., University of Utah

MAJ. RICHARD W. HAFFNER — B.S., Ohio University; M.S., Purdue University; M.B.A., George Washington University

MAJ. JAMES S. KNOX — B.S., United States Military Academy; M.S., Ohio State University

MAJ. WILLIAM D. RALPH, JR. — A.B., Cornell University; M.S., Ohio State University

CAPT. RONALD J. PENICK — B.A., M.S., Miami University, Ohio; Ph.D., Ohio State University

LT. GEORGE J. GAUTHIER — B.S., University of Notre Dame; Ph.D., University of New Hampshire



### Instructors

- MAJ. JOHN H. KARNES — B.S., United States Military Academy; M.S., Texas A&M University
- MAJ. JEROME A. MEYERS — B.S., United States Military Academy; M.S., Syracuse University
- CAPT. JOHN F. ALTENBURG — B.S., North Dakota State University; M.S., University of Illinois
- CAPT. ROBERT L. BUCHENAUER — B.S., M.S., Pennsylvania State University
- CAPT. NORMANTAS KLAUSUTIS — B.Ch.E., M.Ch.E., Syracuse University
- CAPT. MICHAEL J. McCALL — B.S., United States Air Force Academy; M.S., Stanford University
- CAPT. HARVEY-W. SCHILLER — B.S., The Citadel; M.S., University of Michigan
- CAPT. FRANK W. VILLAESCUSA — B.S., M.S., Washington State University
- CAPT. RICHARD L. VOORHEES — B.S., United States Air Force Academy; M.S., Syracuse University
- LT. FRANKLIN H. FRAYER — B.S., Ohio State University; Ph.D., Indiana University
- LT. RALPH W. RUDOLPH — B.S., Pennsylvania State University; M.S., Ph.D., University of Michigan

### CHEMISTRY

#### *Chem 101-102. General Chemistry* 1-1 (E101-E102)

Atomic structure and its relation to chemical bonding, structure and periodic law concepts. Solution chemistry including acid-base theory, equilibria, and electrochemistry. Introduction to organic and nuclear chemistry. Laboratory includes qualitative analysis for selected elements. *Final both semesters. Chem 101-2½ sem hrs, fall; Chem 102-3 sem hrs, spring.*

#### *Chem 121-122. Principles of Chemistry* 1-1 (E121-E122)

Atomic and molecular structure and their relation to states of matter and chemical bonding. Kinetics and equilibria of chemical reactions. Solution chemistry including acid-base theory, ionic equilibria, and electrochemistry. Properties of selected elements and their compounds. Introduction to organic, nuclear, and thermochemistry. Laboratory includes experiments in qualitative and quantitative analysis. *Final exam both semesters. Chem 121-2½ sem hrs, fall; Chem 122-3 sem hrs, spring.*

#### *Chem 151. Accelerated General Chemistry* 1 (E151)

Atomic structure and orbitals, chemical reactions, kinetics and equilibria of gases and solutions, acid-base theory and electro-chemistry. Introduction to organic and nuclear chemistry. Lab. Students are chosen by the department on placement examination scores. Completion fulfills requirements for Chem. 101-102. *Final exam. 2½ sem hrs, fall, plus 3 hrs validation credit.*

#### *Chem 222. Analytical Chemistry* 1 (E222)

Laboratory instruction in classical and modern analytical measurements, supplemented with lectures which emphasize the principles involved in the laboratory. *Final exam. Prereq: Chem 102 or 151. 3 sem hrs, spring.*

#### *Chem 233. Organic Chemistry I* 1 (E233)

Classification and naming of organic compounds, reaction of some aliphatic and aromatic compounds, stereochemistry, introduction to resonance, spectroscopy, and reaction mechanisms. *Final exam. Prereq: Chem 102. An associated lab course, Chem 243, is recommended but is optional for non-chemistry majors. 2½ sem hrs, fall.*

#### *Chem 234. Organic Chemistry II* 1 (E234)

Continuation of the reactions of aliphatic and aromatic compounds and reaction mechanisms. Introduction to carbohydrates, polynuclear aromatics, heterocyclic compounds, and multi-step syntheses. *Final exam. Prereq: Chem 233. An associated lab course, Chem 244, is recommended but is optional for non-chemistry majors. 3 sem hrs, spring.*

*Chem 243. Organic Chemistry I Lab* 1 (E243)  
Experiments in preparation, purification, and characterization of typical organic compounds. Introduction to natural product extractions, infrared spectroscopy, and chromatography as used in organic chemistry. *No final exam. Prereq: Completed or enrolled in Chem 233. 2 sem hrs, fall.*

*Chem 244. Organic Chemistry II Lab* 1 (E244)  
Experiments in qualitative organic analysis including exercises which use infrared spectroscopy and thin layer and gas chromatography. Preparation, purification, and characterization of selected aromatic compounds. Investigation of and experiments utilizing organic name reactions. Preparation of a short paper and a brief oral presentation on a selected topic. *No final exam. Prereq: Chem 243 and completed or enrolled in Chem 234. 2½ sem hrs, spring.*

*Chem 333. Instrument Analysis* 1 (E333)  
Theory and use of common analytical and research instruments. Subjects include: visible-ultraviolet emission and absorption spectroscopy, infrared spectroscopy, nuclear magnetic resonance, x-ray, mass spectrometry, gas chromatography, and electrochemical techniques. Lab. *Final exam. Prereq: Chem 222 or completed or enrolled in Chem 336. 3 sem hrs, spring.*

*Chem 335. Physical Chemistry I* 1 (E335)  
Chemical thermodynamics and equilibria; properties of gases, liquids, and solutions; phase equilibria. *Final exam. Prereq: Chem 102, Math 162 or concurrent enrollment in Math 202 or 231. 2½ sem hrs, fall.*

*Chem 336. Physical Chemistry II* 1 (E336)  
Chemical kinetics, electrochemistry, ionic equilibria, introduction to quantum theory, molecular structure, and spectroscopy. *Final exam. Prereq: Chem 335. 3 sem hrs, spring.*

*Chem 344. Physical Chemistry Lab* 1 (E344)  
Laboratory experiments including molecular weight determinations; physical and thermodynamic properties of gases; heats of reactions and solutions; one, two and three component phase equilibria; homogeneous and heterogeneous chemical equilibria; colligative properties of solutions. Precision of measurements and statistical treatment of data are emphasized. *No final exam. Prereq: Chem 335 and completed or enrolled in Chem 336. 2½ sem hrs, spring.*

*Chem 431. Theoretical Inorganic Chemistry* 1 (E431)  
Theoretical approach to atomic structure, covalent bonding and molecular structure; ionic compounds and coordination compounds; oxidation potentials; acid-base theories; non-aqueous solvents. *Final exam. Prereq: Chem 336. 2½ sem hrs, fall.*

*Chem 432. Systematic Inorganic Chemistry* 1 (E432)  
Applications of Chem 431 with emphasis on a systematic study of the behavior of chemical elements and their inorganic compounds. *Final exam. Prereq: Chem 431. 3 sem hrs, spring.*

*Chem 433. Advanced Organic Chemistry* 1 (E433)  
Molecular structure including bonding and resonance. Kinetic and non-kinetic methods for determining reaction mechanisms. Influence of inductive, field, and steric effects on reaction rates and mechanisms. Application to aliphatic and aromatic substitution reactions, reactions of carboxylic acids and esters, enolization reactions, addition reactions, and free radical reactions. *Final exam. Prereq: Chem 234. 2½ sem hrs, fall.*

*Chem 434. Biochemistry*

1 (E434)

Chemistry of life processes including comparative biochemistry, anabolism and catabolism, blood chemistry, vitamins and hormones, proteins, carbohydrates, mineral metabolism, and enzymes. *Final exam. Prereq: Chem 234. 3 sem. hrs, spring.*

*Chem 435. Advanced Physical Chemistry*

1 (E435)

Discussion of advanced topics in physical chemistry chosen from chemical thermodynamics, chemical kinetics, and kinetic theory. *Final exam. Prereq: Math 251 or 260 and completed or enrolled in Chem 336. 2½ sem hrs, fall.*

*Chem 443. Advanced Physical Chemistry Lab*

1 (E443)

Laboratory experiments including electrochemistry, chemical kinetics, gaseous and liquid transport phenomena, surface phenomena, spectroscopic and magnetic properties of molecules, and radiochemical tracer techniques. The use of modern instrumentation is emphasized. *No final exam. Prereq: Chem 336 and 344. 2 sem hrs, fall.*

*Chem 461. Bonding and Molecular Structure*

2 (E461)

Quantum mechanical treatment of atomic and molecular structure. Emphasis on the nature of chemical bonding including valence bond, molecular orbital, and ligand field theory. Detailed discussion of experimental approaches to the elucidation of molecular and coordination compound structures. Laboratory emphasizes structural analysis utilizing spectroscopic methods. *Final exam. Prereq: Chem 333 and 336. 5 sem hrs, fall. Not offered 1968-1969.*

*Chem 499. Independent Study*

1-2 (E499)

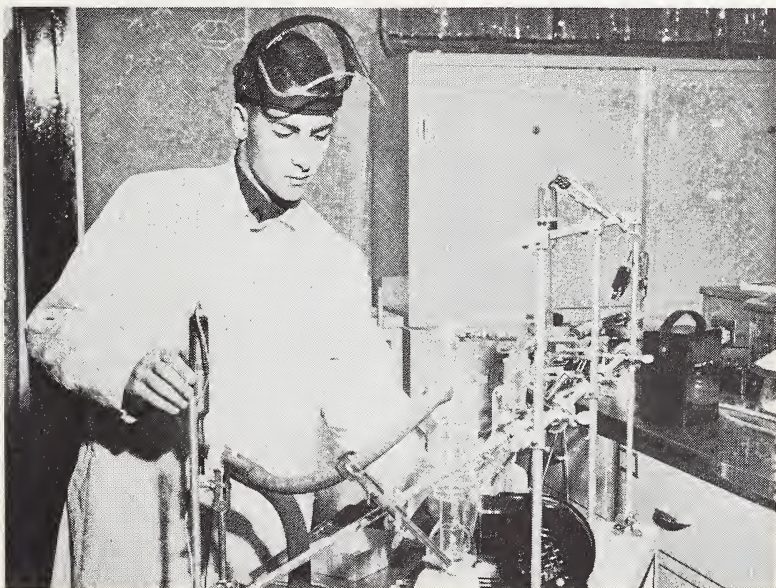
Individual research under the direction of a faculty member. Includes use of chemical literature. *No final exam. Prereq: Chem 244 and 344 and department permission. 1 to 5 sem hrs, fall or spring.*

*Current Course Numbers*

Chem 233  
Chem 234  
Chem 243  
Chem 244  
Chem 335  
Chem 336  
Chem 344  
Chem 443

*Previous Course Numbers*

Chem 331  
Chem 332  
Chem 341  
Chem 342  
Chem 231  
Chem 232  
Chem 241  
Chem 242





## Department of Life Sciences

### Permanent Professor and Head of the Department

LT. COL. PETER B. CARTER — B.A., B.S., Oregon State University; M.D., University of Oregon Medical School

### Tenure Associate Professor

LT. COL. GROVER J. D. SCHOCK — B.S., M.S., Ph.D., University of Illinois

### Associate Professors

MAJ. DANIEL C. PERKINS, JR. — B.S., Texas A&M University; M.S., Trinity University

MAJ. JAMES D. SCHLATTER — A.B., Indiana University; M.S., Kansas State University

MAJ. WILLIAM E. WARD — A.B., Ohio University; A.M., Duke University; Ph.D., Kent State University

### Assistant Professors

MAJ. JOHN J. PENSIERO — B.S., University of New Mexico; M.S., Oklahoma State University

CAPT. CHARLES E. RHODES — B.A., M.A., San Francisco State College

### Instructors

MAJ. CAREY E. BROWN, JR. — B.S., North Carolina State University; M.A., Duke University

CAPT. WILLIAM H. HALLIWELL — D.V.M., Auburn University

LT. DENNIS L. JOHNSON — B.S., M.S., San Diego State College; Ph.D., University of California at Santa Barbara

LT. RICHARD W. BITTRICK — B.A., B.S.M.E., Lehigh University; M.S., Stanford University

## LIFE SCIENCES

*Life Sci 210. Human Physiology* 1 (T210)  
Classroom and laboratory studies of the basic physiology of man. The role of organs and organ systems in man's response to his environment receive emphasis. *Final exam. Prereq: Chem 102, 122 or 151. 2½ sem hrs, fall or spring.*

*Life Sci 260. Modern Biological Concepts* 1 (T260)  
A study of the electron microscopy and organelle physiology in the sub-cellular, cellular, and organ level. Special attention given to intermediate metabolism of the cell and synthesis of macromolecules. *Final exam. Prereq: Life Sci 263. 2½ sem hrs, fall or spring.*

*Life Sci 263. Introduction to Life Sciences* 1 (T263)  
Didactic and practical laboratory studies of the problems of life sciences. Prepares the student for advanced studies in this field. Emphasis placed on structure, physiology, natural history, and evolution of life sciences. *Final exam. Prereq: Life Sci 210. 3 sem hrs, fall or spring.*

*Life Sci 333. Environmental Physiology* 1 (T333)  
The problems of adaptation by living organisms to environmental stresses with special reference to those problems encountered in the Air Force including aerospace, combat, and survival conditions. *Final exam. Prereq: Life Sci 210. 2½ sem hrs, fall.*

*Life Sci 363. Genetics* 1 (T363)  
Study of the laws of inheritance in plants and animals and their application to man. Interrelationships of hereditary and environmental effects on development, growth, and form of living organisms. *Final exam. Prereq: Life Sci 263 or department permission 2½ sem hrs, fall or spring.*



- Life Sci 365. Radiation Biology* 1 (T365)  
 Actions of ionizing and excitational radiations on living organisms. Emphasizes radiations encountered in aerospace operations. *Final exam. Prereq: Life Sci 263 or department permission. 2½ sem hrs, fall or spring.*
- Life Sci 431. Microbiology I* 1 (T431)  
 Lecture and practical laboratory studies of tissues with special emphasis on system and organ identification, by staining techniques and microscopic identification. *Final exam. Prereq: Life Sci 263 and department permission. 3 sem hrs, fall.*
- Life Sci 432. Microbiology II* 1 (T432)  
 Lecture and laboratory studies of bacteria and fungi common to our environment. Systematic identification and physiology of microbial species are emphasized. *Final exam. Prereq: Life Sci 431. 3 sem hrs, spring.*
- Life Sci 452. Space Physiology* 1 (T452)  
 Biosciences and biotechnology as they apply to bioastronautics. Emphasizes biological effects of the space environment. *Final exam. Prereq: Life Sci 210, with Phys 370 desirable. 3 sem hrs, spring.*
- Life Sci 461. Developmental Anatomy I* 2 (T461)  
 Classroom and laboratory study of embryonic development of various vertebrate animals. Detailed study of the fate and function of germ cell layers. *Final exam. Prereq: 1/C standing, Life Sci 263 and department permission. 5 sem hrs, fall.*
- Life Sci 462. Developmental Anatomy II* 2 (T462)  
 Classroom and laboratory study of the comparative anatomy of vertebrate animals. Elements of classification and similarities of function. *Final exam. Prereq: Life Sci 461, 1/C standing and department permission. 5 sem hrs, spring.*
- Life Sci 499. Independent Study* 1-2 (T499)  
 Individual research under the direction of a faculty member. Emphasizes use of laboratory facilities. *No final exam. Prereq: Life Sci 263 and department permission. 2 to 5 sem hrs, as arranged, fall or spring.*

**Current Course Numbers**

Life Sci 210  
 Life Sci 260  
 Life Sci 365  
 Life Sci 452  
 Life Sci 499  
 Life Sci 461  
 Life Sci 462

**Previous Course Numbers**

Physiol 110  
 Biol 362  
 Biol 365  
 Physiol 452  
 Biol 499  
 Life Sci 361 and Biol 361  
 Life Sci 364 and Biol 364



## Department of Mathematics

### *Associate Professor and Head of the Department*

LT. COL. MONTY D. COFFIN — B.S., United States Military Academy; M.S., Massachusetts Institute of Technology; Ph.D., University of California

### *Tenure Associate Professor*

LT. COL. LAWRENCE G. CAMPBELL — A.B., A.M., Montclair State College; M.S., Stanford University

### *Associate Professors*

LT. COL. ROBERT H. JOHNSTON — B.S., M.A., Miami University, Ohio

LT. COL. WELLS P. ROLLINS — B.S., United States Naval Academy; M.S., University of Illinois

LT. COL. DONALD A. SLEZAK — B.S., Oklahoma State University; S.M., Massachusetts Institute of Technology

MAJ. WENDALL C. BAUMAN — B.S., University of Nebraska; M.M.E., University of Oklahoma

MAJ. NICHOLAS P. CALLAS — B.S., United States Naval Academy; M.A., Ph.D., University of Colorado

MAJ. RICHARD L. EISENMAN — A.B., Holy Cross College; M.A., University of Connecticut; Ph.D., University of Michigan

MAJ. WILBURN R. SCHRANK — B.S., Texas A&M University; M.S., New York University; Ph.D., Texas A&M University

MAJ. RICHARD T. WHITE — B.S., United States Military Academy; M.Sc., Ph.D., Ohio State University

MAJ. RICHARD P. YANTIS — B.S., United States Naval Academy; M.A., University of North Carolina; Ph.D., Ohio State University

CAPT. FRANK A. ROESCHER — B.S., United States Naval Academy; Ph.D., University of North Carolina

### *Assistant Professors*

MAJ. DAVID P. BERND — B.S., United States Military Academy; M.S., Oklahoma State University

MAJ. JACK W. COOK — B.S., United States Naval Academy; M.A., University of Texas

MAJ. GEORGE B. GOLLEHON — B.S., United States Naval Academy; M.S., University of Colorado

MAJ. NICHOLAS G. GIONIS — B.S., United States Naval Academy; M.S.E.E., Air Force Institute of Technology

MAJ. ROBERT E. GRASSBERGER — B.S., United States Military Academy; M.S.M.E., Oklahoma State University

MAJ. JOHN D. MORROW — B.A., M.S., Southern Methodist University

MAJ. MERLYN E. NIGHTENGALE — B.S., United States Naval Academy; M.S.E., Ph.D., Arizona State University

MAJ. JOHN P. PORTASIK — B.S., Virginia Military Institute; M.S., University of Illinois; Ph.D., University of Denver

MAJ. JOHN C. RUTH — B.S., United States Naval Academy; S.M., Sc.D., Massachusetts Institute of Technology

MAJ. JOHN B. TILLMAN — B.S., United States Naval Academy; M.S., Purdue University

MAJ. RICHARD H. WARREN — B.S., United States Naval Academy; M.S., University of Michigan

MAJ. CHARLES H. WHEELER — B.S., United States Military Academy; M.S., North Carolina State University

CAPT. NEIL W. GODSEY — B.S., M.S., Oklahoma State University

CAPT. WORTHEN N. HUNSAKER — B.S., Utah State University; M.A., Ph.D., Washington State University

CAPT. DONNELLY J. JOHNSON — B.S.E.E., M.S., University of New Mexico

LT. DAVID C. PETERSON — B.S., Illinois Institute of Technology; M.A., Ph.D., University of California

### **Instructors**

- LT. COL. EDWARD J. GUIDER — A.B., Western Michigan University; M.S., George Washington University; M.A., University of Michigan
- LT. COL. BEN H. HOUSTON — B.S., M.S., Texas A&M University
- MAJ. WILLIAM T. CARTER — B.S., United States Military Academy; M.S., Georgia Institute of Technology
- MAJ. DONALD G. BALISH — B.S., University of Colorado; M.S., Stanford University
- MAJ. RICHARD C. DUTNELL — B.S., United States Naval Academy; M.A.S.E., University of Oklahoma
- MAJ. FRED A. FEDERICI, JR. — B.S., United States Naval Academy; M.A.M., North Carolina State University
- MAJ. RICHARD C. GERHARDT — M.E., Colorado School of Mines; M.S., University of Denver
- MAJ. JEROME G. LAKE — B.S., United States Military Academy; M.S., University of Michigan
- MAJ. ROBERT F. MARKHAM — B.S., United States Military Academy; M.S., University of Michigan
- MAJ. DONALD G. MCCOY — B.S., United States Naval Academy; M.A., University of Oklahoma
- MAJ. OWEN O. MCINTYRE — B.S., United States Military Academy; M.S.E.E., University of Illinois
- MAJ. LAWRENCE F. McNEIL — B.S., United States Military Academy; M.S., Georgia Institute of Technology
- MAJ. OLGERT V. MONTO — B.S., United States Naval Academy; M.A., Arizona State University
- MAJ. WILLIAM F. H. PAGE — B.S., United States Military Academy; M.A.M., North Carolina State University
- MAJ. DONALD D. ROWLAND — B.S., United States Military Academy; M.S., University of Michigan
- MAJ. CLARENCE A. SCHMIDHEISER — B.S., University of Cincinnati; M.S., Oklahoma State University
- MAJ. WILLIAM T. STALLINGS — B.S., University of the South; M.S., University of Texas
- MAJ. CHARLES C. TORREY — B.S., United States Military Academy; M.A., University of Michigan
- MAJ. BENJAMIN E. WALLER III — B.S., United States Military Academy; M.A., Vanderbilt University
- MAJ. WILLIAM W. WELCH — B.S., United States Naval Academy; M.S., University of Michigan
- CAPT. ANTHONY L. BAGGIANO — B.S., The Citadel; M.S., Texas A&M University
- CAPT. RICHARD P. BRADEN — B.M.E., Georgia Institute of Technology; M.S., University of New Mexico
- CAPT. GERALD G. CARSON — B.S., Brigham Young University; M.S., Stanford University
- CAPT. ROBERT G. CRAWFORD — B.S., United States Military Academy; M.A., University of Arizona
- CAPT. PAUL W. ELDER — B.S., Montana State University; M.S., Air Force Institute of Technology
- CAPT. FREDERICK C. FREATHY — B.S., United States Military Academy; M.A., University of Michigan
- CAPT. JAMES L. HEIN — B.A., Northern Michigan University; M.S., University of Michigan
- CAPT. JOSEF C. KRANKEL — B.S., United States Military Academy; M.A., University of California at Berkeley
- CAPT. GORDON E. MARKHAM — B.A., Central Washington College; M.A., Syracuse University
- CAPT. PATRICK L. MUSMAKER — B.S., United States Air Force Academy; M.S., Texas A&M University
- CAPT. WALTER M. PATTERSON, III — B.S., United States Military Academy; M.A., Syracuse University



- CAPT. JAY D. SHERMAN — B.S., United States Naval Academy; M.S., Arizona State University
- CAPT. JAMES W. TAYLOR — B.S., United States Military Academy; M.S., University of Michigan
- CAPT. JOHN L. VITELLI — B.A., College of St. Thomas; M.A., Michigan State University
- CAPT. ALLAN R. WYLIE — B.S., United States Air Force Academy; M.S., North Carolina State University

## MATHEMATICS

*Math 100. College Algebra and Trigonometry* 0 (P100)  
Validation credit only. 0 to 6 semester hours of validation credit to be awarded upon successful completion of the equivalent of core mathematics requirements.

*Math 101. College Algebra, Trigonometry, and Introduction to Calculus* 2 (P101)

Fundamental algebraic operations; inequalities and absolute value; complex numbers; equations, functions, and graphs; use of the slide rule; basic plane trigonometry; trigonometric functions and their inverses; trigonometric equations; determinants; partial fractions; limits, the derivative; continuity; analytic geometry of the straight line; sequences; applications of the derivative. *Final exam. 6 sem hrs, fall.*

*Math 102. Analytic Geometry and Introduction to Calculus* 2 (P102)

Plane and solid analytic geometry, derivatives and integrals of algebraic and transcendental functions, area, volume, centers of mass, numerical integration and approximations, operations with vectors (scalar and vector products). *Final exam. Prereq: Math 101. 7½ sem hrs, spring.*

*Math 131. Introductory Mathematical Analysis* 2 (P131)

Trigonometric functions, complex numbers, theory of equations; analytic geometry, inequalities; limits, continuity; differentiation, derivative, definite integral; applications. *Final exam. 6 sem hrs, fall.*

*Math 132. Calculus and Analytic Geometry* 2 (P132)

Transcendental functions, vectors, methods of integration, applications; plane and solid analytic geometry, infinite series, partial differentiation, multiple integration; linear algebra. *Final exam. Prereq: Math 131. 7½ sem hrs, spring.*

*Math 161. Calculus and Analytic Geometry* 2 (P161)

Inequalities, functions, limits and continuity; analytic geometry and vectors, derivatives and integrals of algebraic and transcendental functions; applications; parametric equations, arc length; polar coordinates. *Final exam. 6 sem hrs, fall.*

*Math 162. Calculus, Analytic Geometry, and Introduction to Differential Equations* 2 (P162)

Methods of integration, applications; solid analytic geometry, vectors in three dimensions; infinite series, partial differentiation, multiple integration; first-order differential equations, higher-order linear differential equations with constant coefficients, applications; introduction to probability and statistics; linear algebra. *Final exam. 7½ sem hrs, spring.*

*Math 163. Calculus, Analytic Geometry and Introduction to Differential Equations* 2 (P163)

Techniques of integration, solid analytics, vector algebra, vector functions, partial differentiation, multiple integrals, infinite series, linear algebra, introduction to differential equations. *Final exam. Prereq: Advanced placement or Math 101 and 102 with department permission. 6 sem hrs, fall.*

- Math 164. Application of Second-Order Differential Equations with Constant Coefficients* 0 (P164)  
Free undamped motion, free damped motion, forced motion, resonance, phenomena, and electric circuit problems; probability to include an introduction to sample spaces, probability measure, conditional probability, and the binomial distribution. *Final exam. Prereq: Math 163. 1½ sem hrs, winter.*
- Math 181. Introduction to Engineering Math* 2 (P181)  
Slide rule, solution of ordinary differential equations by series, introduction to numerical methods, matrix algebra, eigenvalue problems, systems of linear differential equations, introduction to partial differential equations and Fourier series, elementary probability distributions, central limit theorem, hypothesis testing, statistical inference. Math 181 is equivalent to Math 260, 232 and 234. *Final exam. 6 sem hrs, fall.*
- Math 201. Calculus and Introduction to Matrices* 1 (P201)  
Differentiation of vectors, infinite series, partial differentiation, line integrals, multiple integrals, matrix solution of systems of equations. *Final exam. Prereq: Math 102. 2½ sem hrs, fall.*
- Math 202. Introduction to Differential Equations and Probability* 1 (P202)  
Ordinary differential equations through applications of  $n$ th order linear differential equations with constant coefficients. Introduction to probability. *Final exam. Prereq: Math 201. 3 sem hrs, spring.*
- Math 231. Introduction to Differential Equations* 1 (P231)  
Ordinary differential equations through applications of  $n$ th order linear differential equations with constant coefficients. *Final exam. Prereq: Math 132. 2½ sem hrs, fall.*
- Math 232. Probability and Statistics* 1 (P232)  
Probability as a mathematical system, random variables (discrete and continuous) and their distributions, central limit theorem, introductory statistical inference, sampling, confidence intervals, hypothesis-testing, curve fitting. *Final exam. Prereq: Math 132, 201 or 161. 2½ sem hrs, fall or spring.*
- Math 234. Introduction to Probability and Statistics* 0 (P234)  
Elementary set theory, independent and mutually exclusive events, conditional probability, random variables, binomial distribution, OC curves. *Final exam. Prereq: Math 231. ½ sem hrs, winter.*
- Math 260. Applied Math I* 1 (P260)  
Series and numerical methods of solving ordinary differential equations, introduction to partial differential equations and Fourier series, matrix algebra, characteristic values, eigenvectors, systems of differential equations. *Final exam. Prereq: Either Math 162, 164, 202 or 231. 2½ sem hrs, fall or 3, spring.*
- Math 262. Applied Math II (Classes of 1971 and later only)* 1 (P262)  
Continuation of Math 260 together with orthogonal functions; general Fourier expansions to include Bessel function and Legendre polynomial expansions; series solutions to boundary value problems; complex variables including analytic functions, power series, elementary functions, integrals, Cauchy theory, and residues. Credit for this course cannot be given in addition to credit for Math 451, 454 or 455. *Final exam. Prereq: Math 260. 3 sem hrs, spring.*

- Math 341. Introductory Numerical Analysis* 1 (P341)  
Estimates of numerical errors, approximation theory, polynomial approximations, solutions to non-linear equations, numerical method in linear algebra, numerical integration, numerical solutions to differential equations, curve fitting techniques. *Final exam. Prereq: Comp Sci 230, 240 or 254 and either Math 134, 162, 164, 202 or 231. 2½ sem hrs, fall.*
- Math 357. Modern Probability* 1 (P357)  
Random processes; introduction to Markov chains and generalized harmonic analysis with consequent strengthening of the fundamental concepts of modern probability. *Final exam. Prereq: Grade of C or better in Math 232. 2½ sem hrs, fall.*
- Math 360. Linear Algebra (Classes of 1971 and later only)* 1 (P360)  
Algebra and geometry of finite dimensional linear vector spaces, linear transformations, linear systems, unitary and orthogonal transformations, the characteristic value problem, bilinear and quadratic forms. *Final exam. Prereq: Grade of C or better in Math 260. 2½ sem hrs, fall or 3, spring.*
- Math 365. Modern Algebra* 1 (P365)  
Abstract algebra, set theory, number theory, functions, permutations, group theory, ring theory. *Final exam. Prereq: Department permission. 2½ sem hrs, fall or 3, spring.*
- Math 366. Advanced Calculus I* 1 (P366)  
Theoretical study of concepts of calculus: functions, sequences, limits, continuity, differentiation, and related topics. *Final exam. Prereq: Math 251 or 260 and a grade of B or better in either Math 251, 260, 360, 362 or 365. 2½ sem hrs, fall or spring.*
- Math 367. Advanced Calculus II* 1 (P367)  
Continuation of Math 366. *Final exam. Prereq: Grade of C or better in Math 366. 2½ sem hrs, fall.*
- Math 368. Intermediate Differential Equations* 1 (P368)  
Properties of linear differential equations; series solutions; Bessel functions, Legendre equation and orthogonality of functions; Eigenvalue problems. *Final exam. Prereq: Grade of B or better in Math 366. (Not offered 1968-69).*
- Math 441. Linear Programming* 1 (P441)  
Convex sets, linear inequalities, Gauss-Jordan reduction, simplex algorithm, transportation problem, integer linear programming. *Final exam. Prereq: Grade of B or better in Math 260, 360 or 362. 3 sem hrs, spring.*
- Math 442. Game Theory* 1 (P442)  
Fundamental theorem of rectangular games, application of matrix games, saddle points, mixed strategies. Introduction to n-person games and differential games. Solution of 2-person non-zero-sum matrix games. Opportunity for independent study. *Final exam. Prereq: Grade of B or better in Math 202 or equivalent, or department permission. 2½ sem hrs, fall.*
- Math 451. Introduction to Complex Variables* 1 (P451)  
Analytic functions, integrals, derivatives, power series, residues, applications. *Final exam. Prereq: Math 251 or 260 and a grade of B or better in either Math 251, 260, 360, 362 or 365. 2½ sem hrs, fall.*
- Math 454. Vector Analysis, Fourier Series, and  
Boundary Value Problems* 1 (P454)  
Vector analysis to include divergence theorem, Stokes' theorem, consequences and applications; Fourier expansions in various bases including



Legendre polynomials and Bessel functions; solutions of boundary value problems. *Final exam. Prereq: Grade of B or better in Math 251 or 260, or department permission. 2½ sem hrs, fall or 3, spring.*

*Math 455. Advanced Engineering Mathematics* 2 (P455)  
 Vector analysis to include Green's theorem, divergence theorem, Stokes' theorem, Fourier expansions and series solutions to boundary value problems, Laplace transforms and applications to differential equations, conformal mapping. *Final exam. Prereq: Grade of C or better in Math 451. (For class of 1969, a grade of C or better in Math 366.) 5 sem hrs, fall.*

*Math 460. Advanced Topics in Mathematics* 1 (P460)  
 Topics in mathematics. *Final exam. Prereq: Specified when topic is announced. 2½ sem hrs, fall or 3, spring.*

*Math 468. Infinite Processes* 1 (P468)  
 Infinite series of constants, power series, uniform convergence and limits, and related topics. *Final exam. Prereq: Grade of C or better in Math 366. 2½ sem hrs, spring.*

*Math 499. Independent Study and Research* 1-2 (P499)  
 Individual study and research under the direction of a faculty member. *Oral midterm and final research paper required. Prereq: 1/C or 2/C standing and approval of research proposal by Math 499 committee during first week of the semester. 2½ to 5 sem hrs, fall or spring.*

*Math 542. Mathematical Analysis* 1 (P542)  
 Development of real number system from the rational number system, metric spaces, numerical sequences and series, continuity, differentiation, the Riemann-Stieltjes integral, sequences, series of functions. *Final exam. Prereq: Grade of B or better in Math 366. 3 sem hrs, spring.*

*Math 546. Probability* 1 (P546)  
 Theory and applications of analytic probability, proofs, examples, and counterexamples for the central limit theorems and the laws of large numbers, discrete and continuous random variables, density functions and distribution functions, moments, conditional probability and independence, repeated trials, functions of stochastic variables, convolution and the characteristic function. *Final exam. Prereq: Grade of B or better in Math 366, or grade of B or better in Math 362 or 360 and enrollment in Astro-nautics Major. (For classes of 1971 and later, a grade of B in Math 232 also required.) 3 sem hrs, spring.*

*Math 560. Graduate Topics in Mathematics* 1 (P560)  
 Topics in mathematics at the graduate level. *Final exam. Prereq: Specified when topic is announced. 3 sem hrs, spring.*

*Math 571. Numerical Analysis* 1 (P571)  
 Theory of polynomial approximations, interpolation theory, error analysis, theory of numerical quadratures, numerical solutions of differential equations, functional approximations, numerical methods in linear algebra, numerical solutions of non-linear equations. Student participation in computer programming laboratory exercises required. *Final exam. Prereq: Grade of B or better in Math 251 or 260 and Comp Sci 254. 3 sem hrs, spring.*

*Current Course Numbers*  
 Math 232  
 Math 260

*Previous Course Numbers*  
 Math 250, 342  
 Math 251

## Department of Physics

### *Permanent Professor and Head of the Department*

COL. ANTHONY J. MIONE — B.S., United States Military Academy; M.S., Ph.D., North Carolina State University

### *Tenure Associate Professors*

LT. COL. RAYMOND H. KELLEY — B.S., Montana State College; M.S., Ph.D., Ohio State University

MAJ. JACK T. HUMPHRIES — B.S., University of Kentucky; M.S., Air Force Institute of Technology; Ph.D., University of Florida

### *Associate Professors*

LT. COL. WILLIAM B. HAIDLER — B.S., United States Naval Academy; M.S., North Carolina State University; Ph.D., University of Arizona

LT. COL. THOMAS L. JACKSON — B.S., United States Naval Academy; M.S., North Carolina State University; M.A., University of Colorado

MAJ. JOHN F. AHEARNE — B.E., M.S., Cornell University; M.A., Ph.D., Princeton University

MAJ. JOHN C. BALOGH — B.S., United States Naval Academy; M.S., Air Force Institute of Technology; Ph.D., Pennsylvania State University

MAJ. DONALD G. CARPENTER — B.S., University of Maryland; M.S., Air Force Institute of Technology; Ph.D., Iowa State University

MAJ. DONALD R. SMITH — B.S., Kansas State University; M.S., Air Force Institute of Technology; M.A., Ph.D., University of Colorado

### *Assistant Professors*

MAJ. EUGENE M. HENRY — B.S., University of Illinois; S.M., University of Chicago

MAJ. ALEXANDER R. MACDONALD (USA) — B.S., United States Military Academy; M.S., United States Naval Postgraduate School

MAJ. ARMAND D. MAIO — B.S., United States Naval Academy; B.S., University of Washington; M.S., University of Michigan

MAJ. WARREN L. SIMMONS — B.S., Syracuse University; M.S., California Institute of Technology

MAJ. THADDEUS B. WELCH, Jr. — B.S., The Citadel; M.S., University of Oklahoma; M.S., George Washington University

CAPT. DAVID A. LaBAR — B.S., Wisconsin State University; M.S., Vanderbilt University

CAPT. JAMES A. LOYND — B.S., University of Texas; M.S., University of Michigan

CAPT. CHARLES H. ROBISON — B.S., Texas A&M University; M.S., Iowa State University; Ph.D., University of California at Davis

CAPT. WILLIAM M. TONEY — B.S., United States Air Force Academy; M.S., North Carolina State University

CAPT. JOHN E. WROBEL, JR. — B.S., St. Louis University; M.S., Air Force Institute of Technology

### *Instructors*

MAJ. JAMES L. GRIGGS, JR. — B.S., Case Institute of Technology; M.S., Ph.D., Ohio State University

MAJ. LEWIS G. KIRCHNER — B.S., Notre Dame University; M.S., Air Force Institute of Technology

CAPT. THOMAS A. BLACK — B.S., M.S., University of Wyoming

CAPT. CHARLES V. COLLINS — B.S., United States Naval Academy; M.S., Air Force Institute of Technology

CAPT. KENNETH A. GALE — A.B., Kenyon College; M.S., Air Force Institute of Technology

CAPT. JERALD N. JENSEN — B.A., State University of Iowa; M.S., Texas A&M University

CAPT. JIMMY D. KEMPTON — B.S., M.S., University of Idaho

CAPT. JOHN D. MUNSON — B.A., University of Minnesota; M.S., University of Michigan  
 CAPT. THOMAS J. O'CONNOR — B.S., The Citadel; M.S., Vanderbilt University  
 CAPT. PAUL R. OWENS — B.A., Wesleyan University; M.S., Texas A&M University  
 CAPT. WILLIAM L. SCHRADER — B.S., Memphis State University; M.S., Vanderbilt University

## PHYSICS

*Phys 211. General Physics* 1 (S211)  
 Fundamental principles of kinematics, dynamics, and gravitation with emphasis on the use of vectors and calculus. Lab. *Prereq: Math 102 or 132, or concurrent enrollment in Math 162, or department permission. Credit for this course is given only through transfer or validation. 2½ sem hrs.*

*Phys 212. General Physics* 1 (S212)  
 Fundamental principles of wave motion, electricity, and magnetism with emphasis on the use of vectors and calculus. Lab. *Final exam. Prereq: Phys 211, Math 102 or 132 or concurrent enrollment in Math 162, or department permission. 2½ sem hrs, fall.*

*Phys 220. General Physics* 2 (S220)  
 Fundamental principles of kinematics, dynamics, gravitation, wave motion, electricity, and magnetism with emphasis on the use of vectors and calculus. Lab. *Final exam. Prereq: Math 102 or 132, or concurrent enrollment in Math 162, or department permission. 5 sem hrs, fall or spring.*

*Phys 333. Intermediate Physics I* 1 (S333)  
 Kinetic theory, geometrical and wave optics, special relativity, dual nature of matter, introduction to quantum theory, theory of the atom and of molecules, statistical mechanics, the solid state, nuclear physics, elementary particles, and nuclear weapons radiation effects. Lab, spring. *Final exam. Prereq: Phys 220. 2½ sem hrs, fall or 3, spring.*

*Phys 334. Intermediate Physics II* 1 (S334)  
 Continuation of Phys 333. Lab, spring. *Final exam. Prereq: Phys 333 in the preceding semester. 2½ sem hrs, fall or 3, spring.*

*Phys 355. Classical Mechanics* 1 (S355)  
 Fundamentals of classical mechanics including Newton's, Lagrange's, and Hamilton's formulations; the theory of general motion of rigid bodies. Emphasizes relationship of general principles to quantum theory. *Final exam. Prereq: Phys 334 or 363 and Math 260, or department permission. 2½ sem hrs, fall.*

*Phys 363. Introduction to Modern Physics I* 1 (S363)  
 Review of mechanics and introduction to special relativity. Kinetic theory of gases including equation of state, transport phenomena, and Maxwell-Boltzmann distribution; application to weakly ionized gases, plasmas, crystal structure, and certain properties of solids. Dual nature of light and selected topics in physical optics. Introduction to quantum theory; application to atomic and molecular structure, theory of solids, structure and properties of the nucleus. *Final exam. Prereq: Grade of A in Phys 220, or a physics major or master's program, and completed or enrolled in Math 260, or department permission. 2½ sem hrs, fall or 3, spring.*

*Phys 364. Introduction to Modern Physics II* 1 (S364)  
 Continuation of Phys 363. *Final exam. Prereq: Phys 363 in the preceding semester. 2½ sem hrs, fall or 3, spring.*

*Phys 365. Statistical Physics* 1 (S365)  
 Thermodynamics, kinetic theory, and statistical mechanics. Applications include low temperature physics, magnetization, electrical conductivity of



gases, paramagnetism, boson gases, and electrons as a fermion gas. *Final exam. Prereq: Phys 334 or 364, Math 260 and department permission. 3 sem hrs, spring.*

*Phys 370. Introductory Space Science* 1 (S370)

A survey of space phenomena including such areas as magnetic fields, planetary atmospheres, solar phenomena, cosmic rays, and trapped radiation belts. *Final exam. Prereq: Phys 220 and Math 162, 202 or 231. 2½ sem hrs, fall or spring.*

*Phys 380. Geometrical and Physical Optics* 1 (S380)

Topics in geometric optics including reflection, refraction, mirrors, lenses, optical instruments, and photometry. Optical phenomena investigated are interference, diffraction, absorption, scattering, and polarization. Modern applications of optics such as Lasers and Moire pattern are covered. Includes an exercise in the practical application of optics to the satellite tracking program. *Final exam. Prereq: Phys 220. 2½ sem hrs, fall or spring.*

*Phys 430. Introduction to Modern Physics* 1 (S430)

Fundamental concepts of modern physics including special relativity, origin of spectra, quantum nature of radiation, fundamental particles, properties of atoms and nuclei, nuclear reactions, natural and artificial radioactivity, fission, thermonuclear reactors and nuclear weapon radiation effects. *Final exam. Prereq: Phys 220. (Not open to students with credit for Phys 334 or 364.) 2½ sem hrs, fall or spring.*

*Phys 454. Reactor Physics* 1 (S454)

Principles of the nuclear chain reaction, reactor types, neutron diffusion, criticality condition, neutron slowing, the reflected reactor, and transient reactor behavior. *Final exam. Prereq: Phys 334 and Math 260. 3 sem hrs, spring.*

*Phys 461. Electromagnetic Theory I* 1 (S461)

Basic formulation of electromagnetic field theory, with the development and application of Maxwell's equations to transmission of electromagnetic radiation through dielectrics, conductors, and ionized gases. Derivation of multipole radiation theory and the theory of fields of rapidly moving charges. *Final exam. Prereq: Phys 364 and completed or enrolled in Math 454, or department permission. 3 sem hrs, spring.*

*Phys 462. Electromagnetic Theory II* 1 (S462)

Continuation of Phys 461. *Final exam. Prereq: Phys 461 in the preceding semester. 2½ sem hrs, fall.*

*Phys 471. Advanced Topics in Physics* 0-2 (S471)

Selected topics in theoretical and applied physics. *Final exam. Prereq: Department permission. 1 to 5 sem hrs, spring.*

*Phys 473. Introduction to Quantum Mechanics* 1 (S473)

Basic postulates of wave mechanics, techniques of solution of the wave equation, perturbation theory with interdisciplinary illustrations and applications. *Final exam. Prereq: Phys 334 and Math 260. 3 sem hrs, spring.*

*Phys 490. Advanced Physics Lab* 1 (S490)

Selected experiments to develop laboratory skills and reinforce the concepts of physical ideas. *No final exam. Prereq: Department permission. 5 sem hrs, fall.*

*Phys 499. Independent Study* 1-2 (S499)

Individual research under the direction of a faculty member. *No final exam. Prereq: Department permission. 2½ to 5 sem hrs, fall or spring.*

*Phys 563. Quantum Theory I*

1 (S563)

Review of wave mechanics. Postulational basis of quantum mechanics. Operator techniques. Angular momentum, spin, symmetry, and statistics. Development of perturbation theory and variational techniques. Radiative transitions and introduction to the Heisenberg approach. Quantum theory applied to physical problems. (At the discretion of the department, cadets may be transferred from this course to Phys 473.) *Final exam. Prereq: Phys 355 and 364 and completed or enrolled in Phys 461, or department permission.* 3 sem hrs, spring.

*Phys 564. Quantum Theory II*

1 (S564)

Continuation of Phys 563. *Final exam. Prereq: Phys 563 in the preceding semester.* 2½ sem hrs, fall. (Not offered 1968-1969)



**ATMOSPHERIC SCIENCE**

**Tenure Associate Professor**

LT. COL. REX K. MOORHEAD — B.S., M.A., Bowling Green State University

**Instructor**

CAPT. DAVID FERRUZZA — B.S.M.E., Newark College of Engineering; S.M., Massachusetts Institute of Technology

*Atm Sci 250. Introduction to Atmospheric Science*

1 (S250A)

Composition, structure, and behavior of the atmosphere. Fundamental concepts involving physical processes and air motions, and resulting effects on the state of the atmosphere. Lab. *Final exam. Prereq: Completed or enrolled in Phy 220 and Math 202 or 231.* 2½ sem hrs, fall or spring.

*Atm Sci 351. Physical Processes in the Atmosphere*

1 (S351A)

Optical, electrical, and acoustical phenomena of the atmosphere; the laws of radiation; cloud and precipitation physics; radar meteorology. *Final exam. Prereq: Atm Sci 250.* 2½ sem hrs, spring.

*Atm Sci 444. Dynamics of the Atmosphere*

1 (S444A)

Fluid motion, divergence, vorticity, and deformation; equation of continuity; geostrophic, gradient and viscous flow; accelerated motions; pressure changes; fronts and surfaces of discontinuity; circulation, vorticity and divergence theorems and their applications. *Final exam. Prereq: Atm Sci 450.* 2½ sem hrs, spring.

*Atm Sci 450. Thermodynamics and Statics of the Atmosphere*

1 (S450A)

Variables of state, equation of state, thermodynamics of dry and moist air, thermodynamic diagrams; hydrostatic equilibrium and altimetry; changes of phase and processes of saturated air; hydrostatic stability and convection. *Final exam. Prereq: Math 251, completed or enrolled in Atm Sci 250 and Aero 351 or 431.* 2½ sem hrs, fall or spring.

## **DIVISION OF ENGINEERING SCIENCES**

The Division of Engineering Sciences offers courses in aeronautics, astronautics, civil engineering, computer science, electrical engineering, and engineering mechanics. These disciplines are essential to understanding the technology upon which aerospace power depends as well as the technological world in which we live. Air Force applications of engineering sciences are emphasized to give the cadet a basic knowledge of modern weapons systems and an understanding of the problems associated with their design, development and procurement. In laboratory work the cadet gains ability to apply the scientific method to the solution of practical problems and the evaluation of experimental results.

Through the completion of selected courses offered by the division, a cadet may obtain a Major in Aeronautical Engineering, Astronautics, Civil Engineering, Computer Science, Electrical Engineering, Engineering Management, Engineering Mechanics, Engineering Sciences, or General Engineering. Each of these majors provides a foundation for graduate study as well as a particular insight into the engineering technology which will confront a future Air Force officer in these career fields. A Cooperative Master's Degree Program in Astronautics is offered to cadets who are outstanding in the engineering sciences.

### **Department of Aeronautics**

#### ***Permanent Professor and Head of the Department***

COL. DANIEL H. DALEY — B.S., Purdue University; S.M., Massachusetts Institute of Technology

#### ***Professors***

COL. GAGE H. CROCKER — S.B., Massachusetts Institute of Technology; M.S., California Institute of Technology; M.S., Ph.D., University of Michigan.

LT. COL. BLAINE R. BUTLER, JR. — B.S., United States Military Academy; M.S.A.E., Ph.D., Purdue University

#### ***Associate Professors***

MAJ. WENDALL C. BAUMAN — B.S.M.E., University of Nebraska; M.M.E., University of Oklahoma

MAJ. RAYMOND F. KOESTNER — B.S., United States Military Academy; M.A.E., University of Oklahoma

MAJ. RICHARD E. WILLES, B.S., United States Naval Academy; S.M., E.A.A., Ph.D., Massachusetts Institute of Technology

#### ***Assistant Professors***

LT. COL. ROBERT W. MILLING — B.A.E., Georgia Institute of Technology; M.S., Air Force Institute of Technology

LT. COL. BERNARD S. MORGAN, JR. — B.S., United States Naval Academy; M.S.E., Ph.D., University of Michigan

LT. COL. BRUCE E. MORRELL — B.S., Massachusetts Institute of Technology; M.S., Air Force Institute of Technology

- MAJ. ROBERT C. BARLOW — B.S., Texas A&M University; M.S., University of Michigan
- MAJ. DUANE M. DAVIS — B.S., Purdue University; M.S., University of Pittsburgh; Ph.D., Purdue University
- MAJ. JOSEPH E. GRAETCH — B.S., California Institute of Technology; M.S., Purdue University
- MAJ. MYRON D. HARNLY — B.S., United States Naval Academy; M.S., Air Force Institute of Technology
- MAJ. EDGAR A. O'HAIR, JR. — B.S., United States Military Academy; M.S., Purdue University; D.M.E., Columbia University
- MAJ. JOHN V. SCHAFER, JR. — B.S., United States Military Academy; M.S., California Institute of Technology
- CAPT. JOHN S. BRUSH — B.S., United States Air Force Academy; M.S., Massachusetts Institute of Technology
- CAPT. MARK S. DITTRICH — B.S., United States Naval Academy; S.M., Massachusetts Institute of Technology
- CAPT. DON C. ECKHOLDT — B.S., M.S., Arizona State University
- CAPT. CHARLES F. STEBBINS — B.S., United States Air Force Academy; M.S.A.E., California Institute of Technology; Ph.D., University of Colorado
- CAPT. CARL G. STOLBERG — B.S., Iowa State University; M.S., Air Force Institute of Technology

### **Instructors**

- MAJ. CARL G. BAILY — B.S., Colorado State University; B.S., M.S., University of Colorado
- MAJ. PAUL K. BAUMANN — B.S.M.E., Newark College of Engineering; M.S., Air Force Institute of Technology
- MAJ. JOHN J. BEODDY — B.S., United States Military Academy; M.S., Air Force Institute of Technology
- MAJ. PHILIPPE O. BOUCHARD — B.S., United States Military Academy; M.S., University of Oklahoma
- MAJ. JAMES T. CLAY — B.S., Municipal University of Wichita; M.S. University of Michigan; M.A., Princeton University
- MAJ. JOHN M. GROMEK — B.S., United States Military Academy; M.S., Purdue University
- MAJ. EUGENE L. LARSON — B.S., United States Naval Academy; S.M., E.A.A., Massachusetts Institute of Technology
- MAJ. ROBERT F. LOPINA — B.S., Purdue University; M.E., M.S., Ph.D., Massachusetts Institute of Technology
- MAJ. JOHN F. SCHAEFER — B.S., United States Military Academy; M.S., Ph.D., Stanford University
- MAJ. LEO W. STOCKHAM — B.S., United States Naval Academy; S.M., Massachusetts Institute of Technology; Ph.D., University of Oklahoma
- CAPT. DONALD M. BOHLER — B.S., Georgia Institute of Technology; M.S., Stanford University
- CAPT. CARL A. FORBRICH, JR. — B.S., University of Texas; M.S., University of Oklahoma; Ph.D., Stanford University
- CAPT. ROGER W. GALLINGTON — B.S., M.S., University of Illinois
- CAPT. RICHARD R. PRICE — B.S., United States Military Academy; M.S., University of Michigan
- CAPT. CLEVELAND L. PUCKETTE II — B.S., United States Naval Academy; M.S., University of Michigan
- LT. DAVID FINKELMAN — B.S., Virginia Polytechnic Institute; S.M., Ph.D., Massachusetts Institute of Technology

### **AERONAUTICS**

*Aero 331. Aerospace Propulsion*

1 (B331)

Introduction to aerospace propulsion systems. Lab. Final exam. Prereq: Completed or enrolled in Phys 220 and Math 202. 2½ sem hrs, fall.



- Aero 332. Aircraft Flight Mechanics* 1 (B332)  
Introduction to performance, stability and control of airlift vehicles. Lab. *Final Exam. Prereq: Aero 331 or 361. 3 sem hrs, spring.*
- Aero 350. Aeronautical Laboratory* 1 (B350)  
Selected experiments in the fields of aerodynamics, gas dynamics, propulsion, and flight dynamics. *No final. Prereq: Completed or enrolled in Aero 362. 2 sem hrs, fall or spring.*
- Aero 351. Thermodynamics* 1 (B351)  
Zeroth law and temperature, equations of state, first law and energy, heat capacities, p-v-T surfaces of real substances, second law and entropy, and engineering applications. *Final exam. Prereq: Math 162 or 231, or completed or enrolled in Phys 220. 2½ sem hrs, fall or 3, spring.*
- Aero 361. Fluid Dynamics I* 1 (B361)  
Dynamics and thermodynamics of compressible fluid flow. One-dimensional steady flow including nozzles, ducts, normal shocks, friction and heating effects, and some incompressible cases. Introduction to two-dimensional flow. Lab. *Final exam. Prereq: Aero 351 (or Chem 335 for Phys and Chem majors only) and completed or enrolled in Math 260 and Mech 361. 2½ sem hrs, fall or 3, spring.*
- Aero 362. Fluid Dynamics II* 1 (B362)  
Oblique shocks; Prandtl-Meyer flow; linearized theory for supersonic and subsonic flow, with incompressible flow as a special case; second-order theory; airfoil and wing theory. Lab. *Final exam. Prereq: Aero 361. 2½ sem hrs, fall or spring.*
- Aero 363. Heat Transfer* 1 (B363)  
Energy transport by conduction, convection, and radiation. General heat conduction differential equation and its application to simple conduction problems with and without heat generation, heat flow in fins, and unsteady heat flows. Treatment of fluid dynamics and thermal boundary layers as applied to flat plates in forced convection. Reynold's analogy, black and gray body radiation, and radiation inside enclosures. Lab. *Final exam. Prereq: Completed or enrolled in Aero 361, or B or better in Aero 331. 2½ sem hrs, fall or spring.*
- Aero 434. Aircraft and Engine Performance Laboratory* 1 (B434)  
Selected experiments in the fields of flight mechanics and aerospace propulsion. A laboratory course designed for students not pursuing an aeronautical engineering major. *No final. Prereq: Aero 332 or 361. 2 sem hrs, fall or spring.*
- Aero 456. Flight Mechanics* 1 (B456)  
Take-off and landing, level flight, steady climb and accelerated climb, maximum range and endurance. Longitudinal and lateral static stability and control, maneuvering flight, and dynamic stability. Lab. *Final exam. Prereq: Mech 361 and Aero 361, or B or better in Aero 332. 2½ sem hrs, fall or spring.*
- Aero 461. Propulsion I* 1 (B461)  
Aerothermochemistry, airbreathing jet propulsion engines, aircraft performance, chemical rocket propulsion, and space propulsion systems. Lab. *Final exam. Prereq: Aero 361 or B or better in Aero 331 and 332. 2½ sem hrs, fall or 3, spring.*
- Aero 462. Propulsion II* 1 (B462)  
Advanced studies of air breathing and rocket propulsion systems and other energy conversion techniques. *Final exam. Prereq: Completed or enrolled in Aero 461. 2½ sem hrs, fall.*

*Aero 463. Advanced Topics in Aeronautics* 1 (B463)  
Topics of current interest in aerodynamics, propulsion, performance, stability and control. *Final exam. Prereq: Aero 362. 3 sem hrs, spring.*

*Aero 464. Preliminary Design of Airlift Vehicles* 1 (B464)  
Fundamentals of design presented by preliminary design of an advanced airlift vehicle. Determination of vehicle configuration to meet given specifications, weight estimation, selection of propulsive system, performance calculations, longitudinal and lateral static stability analysis. Lab. *Final report. Prereq: Aero 362 and completed or enrolled in Aero 456. 4 sem hrs, spring.*

*Aero 466. Propulsion Design* 1 (B466)  
Individual problems in propulsion systems design. Lab. *Final report. Prereq: Aero 462. 4 sem hrs, spring.*

*Aero 472. Advanced Thermodynamics* 1 (B472)  
Fundamentals of statistical thermodynamics. Probability concepts, kinetic theory of gases, distribution functions, transport properties, Maxwell-Boltzmann statistics, quantum mechanics, quantum statistics, partition functions, thermodynamic properties, and chemical systems. *Final exam. Prereq: Aero 351 and completed or enrolled in Phys 333. 2½ sem hrs, fall.*

*Aero 499. Independent Study* 1-2 (B499)  
Individual study and research supervised by a faculty member. Topic established with the department head. *Final report. 2 to 4 sem hrs, fall or spring.*

*Aero 551. Advanced Flight Mechanics* 1 (B551)  
Advanced topics in dynamics and performance of flight and entry vehicles from the modern control theory viewpoint. Introduction to deterministic and stochastic techniques of Lyapunov, Pontryagin, and Bellman. Topics in hypersonic gas dynamics related to performance of hypervelocity flight vehicles. *Final exam. Prereq: Aero 456. 3 sem. hrs, spring.*

*Aero 552. Experimental Research in Advanced Aeronautics Topics* 1 (B552)  
Individual experimental research at the graduate level on an approved advanced topic in aeronautics with minimum faculty supervision. A combination laboratory-lecture course with emphasis on the theory, application and use of modern experimental techniques, facilities and instrumentation. Student must plan and conduct a research project and analyze and report his results. *Final report. Prereq: Aero 350 and 463. 3 sem hrs, spring.*

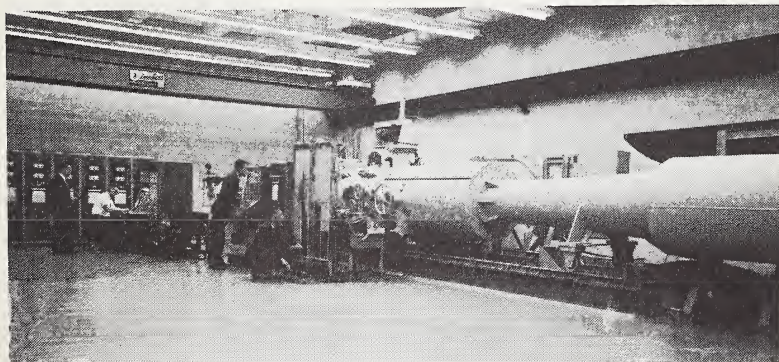
*Aero 599. Independent Study* 1 (B599)  
Independent study and research at the graduate level. Topic established with the department head. *6 to 9 sem hrs, fall or spring.*

#### *Current Course Numbers*

Aero 331  
Aero 332

#### *Previous Course Numbers*

Aero 431  
Aero 432



## Department of Astronautics and Computer Science

### **Permanent Professor and Head of the Department; Chairman of the Engineering Sciences Division**

COL. ROGER R. BATE — B.S., United States Military Academy; B.A., B.Sc., M.A., Oxford University; Ph.D., Stanford University

### **ASTRONAUTICS**

#### **Tenure Associate Professor**

LT. COL. JOHN P. WITTRY — B.S.A.E., St. Louis University; M.S.A.E., Air Force Institute of Technology; A.A.E., University of Michigan

#### **Associate Professor**

MAJ. ALBERT E. PREYSS — S.B., S.M., E.A.A., Sc.D., Massachusetts Institute of Technology

#### **Assistant Professors**

LT. COL. THOMAS C. BRANDT — B.S., United States Naval Academy; M.S.E.E., Air Force Institute of Technology

MAJ. EDWARD J. BAUMAN — B.E.E., University of Minnesota; M.S., Massachusetts Institute of Technology; Ph.D., University of California at Los Angeles

MAJ. JOHN H. DEAN — B.S., United States Naval Academy; M.S.A.E., M.S.I.E., University of Michigan

MAJ. STEPHEN W. GILBERT — B.S., University of Illinois; M.S., University of Colorado

MAJ. DONALD D. MUELLER — B.S.M.E., University of Illinois; M.S., Air Force Institute of Technology

CAPT. ROBERT D. NEAL — B.S.E.E., Colorado State University; M.S.E.E., Air Force Institute of Technology

#### **Instructors**

MAJ. WALTER J. RABE — B.S., United States Military Academy; M.S., University of Michigan

CAPT. ROGER C. BRANDT — B.S.E.E., South Dakota State University; M.S.E.E., Air Force Institute of Technology

CAPT. VICTOR F. BUNZE — B.S., United States Military Academy; M.S.A.E., University of Southern California

CAPT. DANIEL W. WICK — B.S., United States Military Academy; M.S.A.E., M.S. M.E., University of Southern California

#### *Astro 432. Astronautics* 1 (C432)

Two-body orbital mechanics, orbit determination, orbital maneuvers, and ballistic missile trajectories. Introduction to trajectory error analysis, reentry, inertial navigation, guidance and control. Digital computer may be used in problem solutions. *Final exam. Prereq: Math 162, 202 or 231; Phys 211; Comp Sci 230, 240 or 254. 2½ sem hrs, fall or 3, spring.*

#### *Astro 451. Astrodynamics I* 1 (C451)

Fundamentals of free-flight trajectories including the two and three-body problems; ballistic, satellite, interplanetary, and lunar trajectories. Digital computer is used in problem solutions. *Final exam. Prereq: Math 162, 202 or 231; Phys 220; Comp Sci 230, 240 or 254. 2½ sem hrs, fall or 3, spring.*

#### *Astro 452. Linear Control System Analysis* 1 (C452)

Formulation and analysis of the linear control problem by both state variable and transform methods. Synthesis of linear control systems emphasizing the root locus method. Includes laboratory analysis and synthesis with real hardware and/or analog simulation. *Final report. Prereq: Math 251 or 260; El Engr 333, 351 or 361; Mech 361, Sci 350 or El Engr 453. 2½ sem hrs, fall or spring.*



*Astro 453. Astrodynamics II* 1 (C453)  
Problems in fundamentals of orbit determination, trajectory selection criteria, and flight performance during powered flight and reentry trajectories. Digital computer is used extensively in problem solution. *Final report.* *Prereq:* *Astro 451 in preceding semester. 2½ sem hrs, fall or 3, spring.*

*Astro 454. Inertial Navigation and Automatic Guidance* 1 (C454)  
Inertial navigation including studies of the gyroscope, accelerometer, gyro stabilized platform, gyrocompass, system mechanization, navigation equation development and solution. Automatic guidance including methods of developing guidance equations for steering booster rockets to accomplish missions such as orbital injection, orbital intercept, ballistic bombing, and soft landing. *Final report.* *Prereq:* *Astro 451 and 452; completed or enrolled in Astro 453. 3 sem hrs, spring.*

*Astro 464. Ballistic and Space Vehicle Design* 1 (C464)  
Analysis of mission requirements for space vehicles and boosters. Preliminary design of a powered vehicle to satisfy a specific mission requirement. Performance, stability, and control analysis of vehicle design. *Final report.* *Prereq:* *Astro 451, 452 and 453. 4 sem hrs, spring.*

*Astro 465. Control System Theory* 1 (C465)  
Non-linear system analysis including phase plane techniques and Lyapunov stability. Introduction to sampled data systems. Optimal control problem of static and dynamic systems. *Final report.* *Prereq:* *Astro 452. 2½ sem hrs, fall.*

*Astro 466. Control System Design* 1 (C466)  
Design and operation of automatic control systems. Analog and digital computers used as design tools. *Final report.* *Prereq:* *Astro 465. 4 sem hrs, spring.*

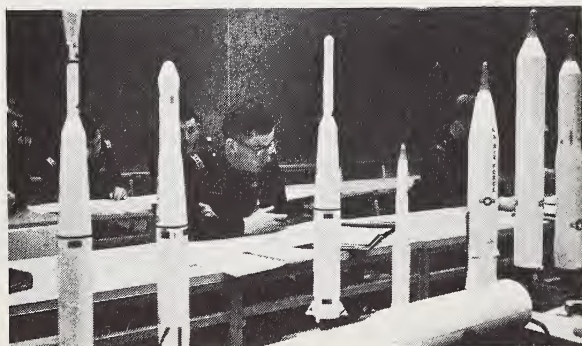
*Astro 499. Independent Study* 1-2 (C499)  
Individual study and research supervised by a faculty member. Topic established with the department head. *Final report.* 2 to 6 sem hrs, fall or spring.

*Astro 551. Advanced Astronautics* 1 (C551)  
Advanced topics in astronautics to include rigorous foundations of astronautics in mechanics and mathematics, the general N-body problem, potential theory, oblate earth, trajectory integration, variation of the elements, trajectory perturbations, navigational guidance theories, and trajectory optimization via the Pontryagin maximum principle. *Final report.* *Prereq:* *Completed or enrolled in Astro 454. 3 sem hrs, spring.*

*Astro 599. Independent Study* 1-2 (C599)  
Independent study and research at the graduate level. Topic established with the department head. *Final report.* 2 to 6 sem hrs, fall or spring.

*Current Course Number*  
*Astro 432*

*Previous Course Number*  
*Astro 401*





## COMPUTER SCIENCE

### Associate Professors

LT. COL. JACOB C. BAIRD — B.S., Southern Illinois University; M.S., Stanford University

MAJ. DENIS A. CONRADY — B.S., United States Naval Academy; M.S.E.E., Massachusetts Institute of Technology; Ph.D., Case Institute of Technology

### Assistant Professors

LT. COL. MONTI D. CALLERO — B.S., University of Washington; M.S., Ph.D., Stanford University

MAJ. GEORGE W. MACPHERSON — B.S.E.E., Air Force Institute of Technology; M.S.E.E., M.S., University of Michigan

MAJ. CLIFFORD J. TRIMBLE — B.S., University of Southern Mississippi; M.C.S., Texas A&M University

CAPT. LARRY H. BUSS — B.A., Syracuse University; M.S., Texas A&M University

CAPT. ROBERT L. FRETWELL — B.A., M.S., State University of Iowa

CAPT. GORDON M. GERSON — B.S., United States Naval Academy; M.S.E., University of Michigan

CAPT. PATRICK L. HARRIS — B.A., Colorado State College; M.S., University of Colorado

CAPT. HARRY M. KEPNER — B.A., Ohio Wesleyan University; M.C.S., Texas A&M University

CAPT. JOSEPH MONROE — B.S., North Carolina State University; M.C.S., Texas A&M University

CAPT. GEORGE L. ROEDER — B.S., M.S., Purdue University

### Comp Sci 230. *Digital Computer Programming —*

#### *Humanities Applications*

1 (C230C)

General theory of stored programs and programming, with humanities applications emphasizing information storage and retrieval and translations. Preparation and execution of programs on the computer. *Final exam.* 2½ sem hrs, fall or spring.

### Comp Sci 240. *Digital Computer Programming —*

#### *Social Sciences Applications*

1 (C240C)

General theory of stored programs and programming, with social sciences applications emphasizing optimization and game techniques and statistical models. Preparation and execution of programs on the computer. *Final exam.* 2½ sem hrs, fall or spring.

### Comp Sci 254. *Digital Computer Programming and*

#### *Numerical Analysis*

1 (C254C)

General theory of stored programs and programming. Introduction to numerical analysis. Practical application through preparation and execution of programs on the computer. *Final exam. Prereq: Math 162, 201 or 234.* 2½ sem hrs, fall or spring.

### Comp Sci 381. *Intermediate Digital Computer Programming*

1 (C381C)

General concepts and specific exercises in digital computer programming at an intermediate level. Applications in symbol and bit manipulation, graphical output, sorts and searches, optimization, and large file manipulation. Includes preparation and execution of several computer programs. *Final exam. Prereq: Comp Sci 230, 240 or 254.* 3 sem hrs, spring.

### Comp Sci 482. *Information Retrieval and Computer Simulation*

1 (C482C)

Techniques for processing large data files including organization, maintenance, sortings and retrieval; storage media; list structure. Theory of system modeling and computer simulation; simulation languages; queuing theory. Includes preparation of several computer programs and group study of a real world problem. *Final report. Prereq: Comp Sci 381.* 3 sem hrs, spring.

*Comp Sci 483. Programming Systems I* 1 (C483C)  
Assemblers, translators, interpreters, executive systems, time-sharing systems. Comparison of program organization using von Neumann and Lukaszewicz methods. Includes preparation of several computer programs. *Final exam. Prereq: Comp Sci 381 and Philos 370. 2½ sem hrs, fall.*

*Comp Sci 484. Programming Systems II* 1 (C484C)  
Compilers for higher order languages. Syntax-directed compilers. Comparison of business-oriented, scientifically-oriented, list processing, string processing, and simulation languages. Includes preparation of several computer programs. *Final report. Prereq: Comp Sci 483. 3 sem hrs, spring.*

*Comp Sci 499. Independent Study* 1-2 (C499C)  
Individual study and research supervised by a faculty member. Topic established with the department head. *Final report. 2 to 6 sem hrs, fall or spring.*

## **Department of Civil Engineering**

### **Professor and Head of the Department**

COL. WINSTON C. FOWLER, B.S., University of Florida; B.S., United States Military Academy; M.S.C.E., Texas A&M University

### **Permanent Professor**

LT. COL. WALLACE E. FLUHR, B.S.C.E., University of Kentucky; M.S., Ph.D., University of Illinois

### **Associate Professors**

LT. COL. THEODORE BACHA — B.S., Pennsylvania State University; M.S.E., Purdue University

LT. COL. WALTER GRANDE, B.S.C.E., University of New Mexico; M.S.E., University of California

CAPT. DANNY N. BURGESS — B.S., M.S., Kansas State University; Ph.D., University of Illinois

### **Assistant Professors**

MAJ. EARL S. DODERER, B.S.C.E., Union College; M.S.E., M.A., Princeton University

### **Instructors**

LT. COL. STUART WOOD, JR. (USA) — B.S., United States Military Academy; M.S., Texas A&M University

MAJ. HARRY E. AULD — B.S., Michigan Technological University; M.S., Ph.D., University of Illinois

MAJ. STERLING E. SCHULTZ — B.S., M.S., University of Arizona; Ph.D., University of Florida

CAPT. GARY S. FLORA — B.S., United States Naval Academy; M.S., University of Pittsburgh

CAPT. JAMES H. LUCAS — B.S.C.E., The Citadel; B.S.C.E., University of Pittsburgh

CAPT. DOUGLAS H. MERKLE — B.C.E., M.S.C.E., Cornell University

CAPT. MARSHALL W. NAY, JR. — B.S.C.E., Virginia Polytechnic Institute; M.S.C.E., Georgia Institute of Technology

## **CIVIL ENGINEERING**

*Civ Engr 340. Surveying* 1 (F340)  
Plane surveying and use of basic equipment, chain, level transit, and plane table alidade. Field problems in measurement of distance, leveling, line direction, angle measurement, horizontal and vertical curves, topography, and earthwork computations. Introduction to photogrammetry. *Final exam. 2½ sem hrs, fall or 3, spring.*

*Civ Engr 352. Water Supply and Waste Disposal* 1 (F352)  
 Design of systems for the collection, treatment and distribution of water and for the collection, treatment and disposal of waste water. *Final exam.*  
*Prereq: Civ Engr 365 or 366. 2½ sem hrs, fall.*

*Civ Engr 366. Fundamental Hydraulics* 1 (F366)  
 Application of the principles of incompressible fluid mechanics. Forces on submerged bodies, dams, potential flow, conduit flow, open-channel flow, dynamic similitude, and turbomachinery. Laboratories in head-loss determination and flow measurement. *Final exam. Prereq: Aero 431 and Mech 361. 2½ sem hrs, spring.*

*Civ Engr 432. Construction Engineering* 1 (F432)  
 Types of construction, construction methods, equipment and materials, methods of cost estimating and scheduling, codes, standards, and recommendation of agencies associated with the building construction industry. *Final report. 2½ sem hrs, fall or 3, spring.*

*Civ Engr 435. Water Resources Engineering* 1 (F435)  
 Hydrology related to water resource planning; probabilistic methods of reservoir management and flood routing; continuity equations for ground-water flow with solutions by flow nets, complex variable methods, and the heat flow analogy; anisotropic flow; design of filters. *Final exam. Prereq: Civ Engr 352. 3 sem hrs, spring.*

*Civ Engr 441. Soil Mechanics* 1 (F441)  
 Engineering properties of soils and shear strength of cohesive and cohesionless soils; consolidation of soils and settlement of structures; stress distribution; lateral earth pressures on structures; ultimate bearing capacity; principles of foundation design. Selected laboratory exercises in soil testing. *Final exam. 2½ sem hrs, fall or 3, spring.*

*Civ Engr 442. Foundation Engineering* 1 (F442)  
 Effects of sub-soil conditions and the behavior of soils on foundation type. Analysis and design of footings, pile foundations, retaining walls, piers, abutments, sheet piling, and soil-structure interface problems of missile silos. *Final exam. Prereq: Civ Engr 441; completed or enrolled in Civ Engr 457. 2½ sem hrs, fall or 3, spring.*

*Civ Engr 450. Properties of Materials Laboratory* 1 (F450)  
 Behavior of construction materials including theories of failure. Principles of testing machines and measuring devices. Application of American Society of Testing Materials (ASTM) standard techniques to demonstrate behavior of structural materials. *No final. Prereq: Mech 362. 2½ sem hrs, fall or spring.*

*Civ Engr 451. Structural Analysis* 1 (F451)  
 Behavior of statically determinate and indeterminate structures due to various loadings and deflections. Classical deflection analyses of bending and axial force elements lead into stiffness and flexibility solutions for indeterminate structures. The digital computer is used for highly indeterminate structures. *Final exam. Prereq: Mech 362 and Math 251 or 260. 2½ sem hrs, fall or 3, spring.*

*Civ Engr 454. Structural Dynamics* 1 (F454)  
 Analysis and design of structures for dynamic loads. Numerical and rigorous analyses of elastic and elastoplastic systems. Design of reinforced concrete and structural steel structures for dynamic loads including both elastic and

inelastic response. Design for earthquake and air blast loads. *Final exam.* *Prereq: Completed or enrolled in Civ Engr 457. 3 sem hrs, spring.*

*Civ Engr 456. Structural Engineering* 1 (F456)  
Design of complete structures of steel and reinforced concrete including foundation design, structural frames, floor systems, wall systems, and roof systems. Determination of design loads on multi-story structures. *Final report.* *Prereq: Civ Engr 441 and 457. 3 sem hrs, spring.*

*Civ Engr 457. Structural Steel and Reinforced Concrete Design* 2 (F457)  
Design of structural elements including tension members, beams, compression members, connections, rigid frames and slabs. Flexure, shear, tensile, anchorage and bond, buckling, shrinkage, creep, and combined stresses are included in design problems. Working stress, ultimate strength, and plastic design theories used in comparison design problems. *Final exam.* *Prereq: Civ Engr 451. 5 sem hrs, fall or 6, spring.*

*Civ Engr 461. Air Base Engineering* 1 (F461)  
Geometric design of airfields including runway length and orientation (wind roses), taxiway and apron configurations, support areas, airfield lighting and marking; principles of planning, land use, and site selection; airspace criteria, noise contours, and zoning; military construction programming; introduction to airfield pavement design, blast loading on simple structures, and fallout protection. *Final exam.* *2½ sem hrs, fall or spring.*

*Civ Engr 462. Pavement Design* 1 (F462)  
Properties of pavement components and stress distribution; structural design of flexible and rigid pavements; joints and reinforcements; airfield paving requirements and construction methods; effects of climatic variables on design criteria. *Final exam.* *Prereq: Civ Engr 441. 2½ sem hrs, fall or 3, spring.*

*Civ Engr 464. Civil Engineering Design* 1 (F464)  
Individual investigation, either analytically or experimentally, of civil engineering problems. Specialized topics in mechanics of materials, structural steel design, reinforced concrete design, structural dynamics, soil dynamics, aerospace facilities design, and air base master planning may be studied. Students are individually supervised but must formulate their own investigation techniques and conclusions. *Final report.* *Prereq: 1/C standing and an engineering major. 4 sem hrs, fall or spring.*

*Civ Engr 499. Independent Study* 0-1 (F499)  
Individual study and research in an advanced civil engineering topic approved by the department head. *Final report.* *1 to 3 sem hrs, fall or spring.*

*Civ Engr 541. Advanced Soil Mechanics* 1 (F541)  
Advanced theories of consolidation, stress distribution, bearing capacity analyses, lateral pressures, stress-strain relations, and shear strength of soils. *Final exam.* *Prereq: Civ Engr 441. 3 sem hrs, spring.*

*Civ Engr 552. Numerical Methods in Structural Analysis* 1 (F552)  
Numerical integration procedures, relaxation and iteration methods, finite differences, matrix applications to force and displacement methods, and computer applications. *Final exam.* *Prereq: Comp Sci 254 and Civ Engr 451. 3 sem hrs, spring.*

#### *Current Course Numbers*

Civ Engr 340  
Civ Engr 366  
Civ Engr 450  
Civ Engr 457

#### *Previous Course Numbers*

Civ Engr 342  
Civ Engr 365  
and Aero 365  
Civ Engr 350  
Civ Engr 453 and 455



## Department of Electrical Engineering

### *Permanent Professor and Head of the Department*

COL. ROLAND E. THOMAS — B.S., New Mexico State University; M.S., Stanford University; Ph.D., University of Illinois

### *Tenure Associate Professors*

LT. COL. CARL F. DAVIS — B.A., University of Maine; B.S.E.E., Air Force Institute of Technology; M.S.E.E., Ph.D., University of Illinois

MAJ. RICHARD J. GOWEN — B.S., Rutgers University; M.S., Ph.D., Iowa State University

### *Associate Professors*

LT. COL. EDWARD E. BOHE — B.S.E.E., University of Arkansas; M.S., North Carolina State University

LT. COL. EVERETTE T. GARRETT — B.A., Cornell College; M.A., State University of Iowa

LT. COL. RICHARD M. JOPPA — B.S., Colorado State University; M.S., Ph.D., University of Illinois

MAJ. ROBERT W. BURTON — B.S., United States Naval Academy; E.E., S.M., Massachusetts Institute of Technology; Ph.D., Harvard University

### *Assistant Professors*

MAJ. WILLIAM D. ANDERSON — B.A., Colorado State College; B.S.E.E., M.S.E.E., University of Colorado

MAJ. KENNETH S. SCHRODER — B.S.E.E., M.S.E.E., University of Illinois

MAJ. GLENN H. STUMPF — B.S., Pennsylvania State University; M.S., Ph.D., University of Illinois

CAPT. HAROLD C. FALK — B.S., M.S., South Dakota State University; Ph.D., Oklahoma State University

### *Instructors*

MAJ. CLIFFORD H. ALLEN, JR. — B.S.E.E., Colorado State University; M.S.E.E., University of Illinois

MAJ. NED D. ARNOLD — B.S., Kearney State College; B.S., M.S., University of New Mexico

MAJ. MARVIN J. BARTH — B.S., United States Naval Academy; M.S., Air Force Institute of Technology; Ph.D., Syracuse University

MAJ. JOSEPH J. BLUM — B.S., Iowa State University; M.S., Air Force Institute of Technology

MAJ. RAYMOND J. BUBICK — B.S.B.A., University of Notre Dame; B.S.E.E., M.S.E.E., University of Colorado

MAJ. DANIEL W. BUEHLER — B.S., M.S., Air Force Institute of Technology

MAJ. RICHARD E. FITTS — B.E., Yale University; S.M., Ph.D., Massachusetts Institute of Technology

MAJ. CORNETT E. HALL — B.S., University of Kansas; B.S., M.S., Air Force Institute of Technology

MAJ. JOSEPH A. KRUPINSKI — B.S., United States Naval Academy; M.S.E.E., Oklahoma State University

MAJ. WARREN D. PEELE — B.S.E.E., M.S.E.E., University of Colorado

MAJ. EDWARD P. SCHELONKA — B.S.E.E., University of Wisconsin; M.S.E.E., Air Force Institute of Technology

MAJ. HAROLD C. SCHLICHT — B.S., United States Naval Academy; M.S., University of Illinois

MAJ. JERRY D. STEPHENS — B.S., United States Naval Academy; M.S., University of Colorado

MAJ. CLARENCE S. SUMMERS, JR. — B.S., United States Naval Academy; M.S.E.E., Oklahoma State University

MAJ. GEORGE V. VON TERSCH — B.S.E.E., Iowa State University; M.S.E.E., Air Force Institute of Technology; M.S.B.A., George Washington University

CAPT. PAUL W. CLARK — B.S., University of Minnesota; A.M., Duke University; B.S.E.E., M.S.E.E., University of Pittsburgh

CAPT. MAX I. MILLER, JR. — B.S., United States Air Force Academy; M.S.E.E., University of Colorado

CAPT. CHARLES W. MITCHELL — B.S., United States Military Academy; M.S.E.E., University of Illinois

## ELECTRICAL ENGINEERING

### *El Engr 333. Introduction to Electronic Systems I* 1 (H333)

Concept of an electric circuit, analysis of complete response by modeling and laboratory techniques, conduction in solids, P-N junctions, simple diode and transistor applications. Lab. *Final exam. Prereq: Phys 212 or 220; Math 162, 202 or 231. 2½ sem hrs, fall.*

### *El Engr 334. Introduction to Electronic Systems II* 1 (H334)

Continuation of El Engr 333. Includes vacuum and semiconductor devices with applications in instrumentation, communication, and energy conversion systems. Lab. *Final exam. Prereq: El Engr 333 in preceding semester. 3 sem hrs, spring.*

### *El Engr 351. Analysis of Electronic Systems I* 1 (H351)

Concept of a circuit, mathematical analysis of electric circuits, signal representation, conduction in solids, P-N junctions, simple diode and transistor applications. Lab. *Final exam. Prereq: Phys 212 or 220; Math 162, 202 or 231. 2½ sem hrs, fall or 3, spring.*

### *El Engr 352. Analysis of Electronic Systems II* 1 (H352)

Continuation of El Engr 351. Includes vacuum and semiconductor devices with applications to instrumentation, control, and energy conversion systems. Lab. *Final exam. Prereq: El Engr 351 in preceding semester. 2½ sem hrs, fall or 3, spring.*

### *El Engr 361. Intermediate Circuit Analysis* 1 (H361)

Mathematical analysis of electric circuits with emphasis on fundamental principles, natural and forced response, frequency response, pole-zero concept, loop and nodal analysis, and basic network theorems. Lab. *Final exam. Prereq: El Engr 351. 2½ sem hrs, fall.*

### *El Engr 362. Intermediate Electronics* 1 (H362)

Semiconductor and vacuum diodes, power supplies and filters, four-terminal networks, and the vacuum tube and transistor in amplifiers. Lab. *Final exam. Prereq: El Engr 351. 2½ sem hrs, fall.*

### *El Engr 363. Advanced Circuit Theory* 1 (H363)

Steady-state response of inductive and capacitive circuits using s-plane geometry techniques. Includes resonance, impedance and circle diagrams, generalized AC networks, magnetically coupled circuits, polyphase circuits, and an introduction to network synthesis and filters. Lab. *Final exam. Prereq: Grade of B or better in El Engr 361, or department permission. 3 sem hrs, spring.*

### *El Engr 364. Advanced Electronics* 1 (H364)

Development of semiconductor devices and circuits based on a piecewise linear approximation. Transistor biasing, loading, and amplifier design; comparison of design techniques between high vacuum and semiconductor circuits; amplifier circuits with feedback and frequency compensation; wave-shaping, pulse and digital circuits. Lab. *Final exam. Prereq: Grade of B or better in El Engr 362, or department permission. 3 sem hrs, spring.*

### *El Engr 365. Fundamentals of Electromagnetic Fields* 1 (H365)

Classical boundary value problems in static electric and magnetic fields. Introduction to time-changing fields. Relationship established between field

and circuit theory. Lab. *Final exam. Prereq: Phys 212 or 220; El Engr 333, 351. 2½ sem hrs, fall.*

*El Engr 366. Advanced Electrical Energy Conversion* 1 (H366)  
Principles of energy conversion, rotating AC and DC machinery, and transformers. Electromechanical dynamic equations formulated from applied basic principles, and s-plane analysis utilized to obtain transfer functions. Lab. *Final exam. Prereq: El Engr 365. 2½ sem hrs, fall. (Not offered 1968-69.)*

*El Engr 433. Electrical Applications* 1 (H433)  
Power generation and distribution, electromagnetic theory, communications and radar systems, analog computation, and component and system reliability. Lab. *Final exam. Prereq: El Engr 334 or 352. 2½ sem hrs, fall.*

*El Engr 453. Analog Computation* 1 (H453)  
Analog computer techniques applied to the solution of differential equations. Electronic computing circuits, time and magnitude scale factors, and problem set-up procedures. *Final exam. Prereq: Math 162, 202 or 231; completed or enrolled in El Engr 333 or 351. 2½ sem hrs, fall or 3, spring.*

*El Engr 454. Linear Systems Synthesis* 1 (H454)  
Network synthesis or control system synthesis using techniques of Routh, Hurwitz, Bode, Nyquist, and Evans. *Final exam. Prereq: El Engr 352 or 362 and Astro 452. 2½ sem hrs, fall or 3, spring.*

*El Engr 455. Fundamentals of Electronic Communication* 1 (H455)  
Power amplifiers, signal-flow-graph theory, oscillators, and inverse-feedback amplifiers. Principles of basic military communication systems including modulation, demodulation, frequency selective circuits, wave-shaping, transmitters, receivers, transmission lines, propagation, antennas and radar. Lab. *Final exam. Prereq: El Engr 352 or 362 in preceding semester. 2½ sem hrs, fall or 3, spring.*

*El Engr 462. Communication Engineering* 1 (H462)  
Techniques of modern communication systems from the circuits viewpoint. Lab. *Final exam. Prereq: El Engr 362 and 363. 2½ sem hrs, fall.*

*El Engr 464. Design* 1 (H464)  
Application of basic engineering design principles in the electrical engineering area. Area of emphasis depends on preparatory courses taken. *Final paper and oral report. Prereq: El Engr 453 or 454. 4 sem hrs, fall or spring.*

*El Engr 466. Electronic Design* 1 (H466)  
Design considerations of practical electronic circuits and devices. Design of vacuum tube and semiconductor amplifiers, control circuits, radio frequency amplifiers, feedback compensation techniques, communications and telemetry. Component size and heat limitations and relative circuit economics. Each student must complete an approved design project. Lab. *Final paper and oral report. Prereq: Completed or enrolled in El Engr 462. 4 sem hrs, spring.*

*El Engr 477. Electromagnetic Transmission and Radiation* 1 (H477)  
Maxwell's equations and their application to transmission lines, waveguides, and antennas. Plane waves in dielectric and conducting media. Lab. *Final exam. Prereq: El Engr 365. 2½ sem hrs, fall or 3, spring.*

*El Engr 478. Principles of Communication Theory* 1 (H478)  
Basic concepts of information theory applied to communications systems. Frequency and time domain, random signal theory, basic information theory and noise. *Final exam. Prereq: El Engr 455 or 462. 3, spring.*

*El Engr 482. Design of Logical Circuits and Systems* 1 (H482)  
Boolean algebra, number systems, switching circuits, logical circuit organiza-

tion and minimization, and the higher logical organizations required for digital computation. *Final exam. Prereq: Grade of B or better in El Engr 352 or 362. 2½ sem hrs, fall or 3, spring.*

*El Engr 499. Independent Study*

1-2 (H499)

Individual study and research in an engineering design topic approved by the department head. *Final paper and oral report. 2½ to 6 sem hrs, fall or spring.*

*El Engr 541. Advanced Network Theory*

1 (H541)

Computer analysis of linear, time-variable, and nonlinear circuits; analysis of n-ports; Manley-Rowe relations; synthesis of networks and n-ports; scattering concepts; positive and bounded-real matrices; topological methods; Hilbert transforms and linear vector spaces. *Final exam. Prereq: El Engr 363. 3, spring.*

*El Engr 561. Advanced Applications of Physical Electronics*

1 (H561)

Study of advanced semiconductor devices and representative circuits in which they are employed. Devices considered are those depending on the diffusion, drift, thermoelectric, photoelectric, electromechanical, electromagnetic, Zener breakdown, tunneling, and surface types of effects in semiconductor materials. *Final exam. Prereq: Mech 455 and El Engr 364. 3, spring.*

*El Engr 571. Electromagnetic Theory and Systems*

1 (H571)

Reciprocity and equivalence principles; plane, cylindrical and spherical wave problems, conformal field mapping, potential theory; Green's theorem and function; variational principles; scattering and diffraction problems; applications to waveguides, resonant cavities, high frequency oscillators, and antennas. *Final exam. Prereq: El Engr 477. 2½ sem hrs, fall or 3, spring.*

**Current Course Numbers**

El Engr 333  
El Engr 334

**Previous Course Numbers**

El Engr 331  
El Engr 332

## Department of Engineering Mechanics

### **Permanent Professor and Head of the Department**

COL. PHILIP L. ERDLE — B.S., United States Military Academy; M.S., University of Michigan; Ph.D., University of Colorado

### **Tenure Associate Professors**

LT. COL. DOUGLAS C. DOWELL — B.S., University of Iowa; M.S., Air Force Institute of Technology; Ph.D., Iowa State University

MAJ. PRESTON S. HARVILL, JR. — B.S., United States Military Academy; M.S., Stanford University

### **Associate Professors**

LT. COL. RICHARD K. SAXER — B.S., United States Naval Academy; M.S., Air Force Institute of Technology; Ph.D., Ohio State University

MAJ. MERLE D. BACON — B.S.A.E., Wichita State University; M.S.A.E., Ph.D., University of Oklahoma

MAJ. WILLIAM C. GILTNER — B.S., University of New Mexico; M.S., University of Illinois

MAJ. ROY M. GOODWIN — B.S., Ohio University; M.S., Ph.D., University of Colorado

CAPT. JOHN P. ANDERSON — B.S., M.S., Ph.D., Georgia Institute of Technology

CAPT. JOHN P. KERSHAW — B.Ch.E., Syracuse University; Sc.D., Massachusetts Institute of Technology

LT. JAMES H. WOODWARD — B.S.E., M.S.A.E., Ph.D., Georgia Institute of Technology



### **Assistant Professors**

- MAJ. HOWARD V. ANDRE, JR. — B.S., United States Naval Academy; M.S., Georgia Institute of Technology
- MAJ. STANLEY G. EBNER — B.S., University of Nebraska; B.S., M.S.A.E., University of Colorado
- MAJ. THOMAS E. KIRCHGESSNER — B.S., United States Military Academy; M.S. M.E., Rensselaer Polytechnic Institute; Ph.D., University of Colorado
- MAJ. IRVIN E. REEP — B.S.A.E., M.S.A.E., University of Colorado

### **Instructors**

- MAJ. JOSEPH S. FORD II — B.S.A.E., Georgia Institute of Technology; M.S.E., Stanford University
- MAJ. WARREN R. HORNEY — B.S.M.E., Purdue University; M.S.E.M., Georgia Institute of Technology
- MAJ. MICHAEL R. KEATING — B.S., United States Military Academy; M.S., Air Force Institute of Technology
- CAPT. FRANCIS B. CROWLEY III — B.S., United States Military Academy; M.S.E., Princeton University
- CAPT. RICHARD H. DANHOF — B.S., United States Naval Academy; M.S., Stanford University
- CAPT. JOSEPH G. DeSANTIS — B.S., United States Air Force Academy; M.S.A.E., Air Force Institute of Technology
- CAPT. WILLIAM A. EDGINGTON — B.S., University of Cincinnati; M.S.A.E., Air Force Institute of Technology
- CAPT. CHARLES C. HANSULT — B.S., United States Military Academy; M.S., Oregon State University
- CAPT. JAMES M. McCORMACK — B.S., University of Rochester; M.S., Air Force Institute of Technology
- CAPT. CRAIG V. MILLER — B.S., United States Air Force Academy; M.S., University of California at Berkeley
- CAPT. RICHARD A. MOLLICONE — B.S., United States Military Academy; M.S.E.M., Rensselaer Polytechnic Institute
- CAPT. LOUIS J. PRIME, JR. — B.S., United States Military Academy; M.S.E., University of Michigan
- CAPT. JAMES A. SNIDE — B.S.M.E., Ohio University; M.S., Air Force Institute of Technology
- CAPT. DAVID O. SWINT — B.S.M.E., University of Texas; M.S.M.E., California Institute of Technology
- CAPT. GARY R. VERFUSS — B.S., United States Air Force Academy; M.S., Cornell University
- LT. STEVEN A. CRIST — B.S.E., M.S.E., Ph.D., University of Michigan
- LT. RONALD H. HARDY — B.S.M.E., M.S.E.M., Georgia Institute of Technology

### **ENGINEERING MECHANICS**

- Mech 120. Engineering Fundamentals* 1 (R120)  
Introduction to engineering. Includes fundamentals of problem synthesis and analysis with application of physical laws to the solution of basic engineering problems. Creative problems in introductory design and analysis included in the spring semester. *Final exam in fall. Final problem in spring. 2½ sem hrs, fall or 3, spring.*
- Mech 342. Materials Processing* 1 (R342)  
Metallurgical control of the mechanical properties of materials; physical laws and basic principles underlying the processing of materials and the fabrication of useful shapes; advantages and disadvantages of the various manufacturing processes. Field trip and lab. *Final exam. 2½ sem hrs, fall or spring.*
- Mech 343. Corrosion Control* 0 (R343)  
Basic principles of electrochemical corrosion; problems of corrosion in atmospheric, soil, aqueous, and special environments; detailed descriptions

of protection systems. Emphasizes actual case analysis drawing from current Air Force experience. *Final exam. Prereq: Chem 102. ½ sem hr, winter.*

**Mech 350. Experimental Stress Analysis** 1 (R350)  
Analysis of stress and strain in irregular forms by the use of electronic strain gages, photoelasticity, stresscoat, interferometry and models. Lab. *No final. Prereq: Mech 362. 3 sem hrs, spring.*

**Mech 355. Materials Science** 1 (R355)  
Principles underlying the properties and behavior of materials. Atomic arrangements and imperfections; electronic structure and properties; phase relationships in one and multi-component systems; elasticity, plasticity, and fracture; recovery, recrystallization, and grain growth; diffusion; chemical behavior and corrosion. *Final exam. Prereq: Phy 212 or 220 and Chem 102. 2½ sem hrs, fall or 3, spring.*

**Mech 361. Vector Engineering Mechanics** 1 (R361)  
Vector statics including resultants, equilibrium, and friction. Vector kinematics including absolute and relative motion. Vector kinetics including force-mass-acceleration, work-energy, and impulse-momentum methods. *Final exam. Prereq: Mech 120 and Math 162, 201 or 231. 3 sem hrs, fall or spring.*

**Mech 362. Mechanics of Materials** 1 (R362)  
The stresses and deflections developed in materials as a result of centric, torsional, flexural, and combined loadings. Includes statically indeterminate beams and columns. Lab. *Final exam. Prereq: Mech 361. 3 sem hrs, fall or spring.*

**Mech 364. Mechanics and Properties of Materials** 2 (R364)  
The stresses and deflections developed in materials as a result of centric, torsional, flexural, and combined loadings. Includes statically indeterminate beams and columns. Basic material properties relating to strength and fabrication of engineering materials. Relation of microstructural features to macroscopic behavior. Field trips and lab. *Final exam. Prereq: Mech 361. 5 sem hrs, fall.*

**Mech 424. Advanced Strength of Materials** 1 (R424)  
Relationship between stress, strain, and deformation in structures and structural elements. Includes failure theories, shear flow, unsymmetrical bending, curved beams, beams on elastic support, torsion applied to bars with non-circular cross-section, thick-walled cylinders, and buckling of columns. *Final exam. Prereq: Mech 362. 2½ sem hrs, fall or 3, spring.*

**Mech 452. Advanced Structural Mechanics** 2 (R452)  
Relationship between stress, strain, and deformation in structures and structural elements. Matrix analysis to analyze redundant structures. Includes failure theories, shear flow, unsymmetrical bending, curved beams, and column buckling. *Final exam. Prereq: Mech 362. 5 sem hrs, fall.*

**Mech 453. Aerospace Structures** 1 (R453)  
Matrix structural analysis to include energy and direct stiffness methods plus selected problems in unsymmetrical bending, shear flow, beam columns, curved beams, and buckling of columns. Introduction to structural dynamics. *Final exam. Prereq: Mech 362. 2½ sem hrs, fall or 3, spring.*

**Mech 455. Electronic Processes in Materials** 1 (R455)  
Development of general electronic models of solid materials; electrical properties of conductors, insulators, and semi-conductors; thermal, thermoelectric, magnetic, dielectric, and optical properties of materials. *Final exam. Prereq: Phys 212 or 220. 2½ sem hrs, fall or 3, spring.*

*Mech 456. Mechanical Metallurgy* 1 (R456)  
 Behavior of metals under simple and combined stress systems. Elements of elastic theory, plastic deformation, elementary dislocation theory, strength theories, creep, fatigue, and fracture. *Final exam. Prereq: Mech 342 or 355. 2½ sem hrs, fall or 3, spring.*

*Mech 459. Advanced Aerospace Materials* 1 (R459)  
 Study of advanced and theoretical topics associated with the development of materials for aerospace systems. An examination of materials behavior in extreme environments. Analysis of high strength, oxidation resistant, high temperature, and composite materials. *Final exam. Prereq: Mech 355 and 362. 3 sem hrs, spring.*

*Mech. 464. Design* 1 (R464)  
 Individual tutorial problems in aerospace structures, dynamics, mechanics of materials, or properties of materials. *Final report. Prereq: One of the following, according to nature of the design project undertaken: Mech 350, 355, 452, 453, 455, 456, 459, 480, or 554. 4 sem hrs, fall or spring.*

*Mech 480. Advanced Topics in Mechanics or Materials Engineering* 1 (R480)  
 Selected topics in engineering mechanics or materials engineering. *Final exam. Prereq: Specified when topic is announced. 2½ to 4, sem hrs, fall or spring.*

*Mech 499. Independent Study* 0-2 (R499)  
 Individual study and research in topic established with the department head. *Final report. 1 to 5 sem hrs, fall or spring.*

*Mech 554. Advanced Dynamics* 1 (R554)  
 Study of three-dimensional kinematics, particle dynamics, dynamics of particle systems, LaGrangian dynamics, and dynamics of rigid bodies. *Final exam. Prereq: Mech 361; Math 251 or 260. 2½ sem hrs, fall or 3, spring.*

*Mech 571. Advanced Aerospace Structures* 1 (R571)  
 A continuation of Mech 452 with increased emphasis on application of energy methods to beams, beam columns, and plates. Theories of minimum potential and minimum complementary energy are used. Energy methods are applied for stability applications to include postbuckling of columns, plates, and cylindrical shells. *Final exam. Prereq: Mech 452 or 453; completed or enrolled in Math 454. 3 sem hrs, spring.*

*Mech 572. Vibrations of Aerospace Structures* 1 (R572)  
 Linear vibrations of single and multi-degree of freedom systems including free and forced responses. Exact and approximate analyses of linear vibrations of continuous bodies. Introduction to nonlinear oscillations of a single degree of freedom system. *Final exam. Prereq: Math 260 or 262; Mech 554 or Phys 355. 2½ hrs, fall or 3, spring.*

*Mech 573. Continuum Mechanics* 1 (R573)  
 Introduction to tensor analysis, with emphasis on cartesian tensors, and a review of vector calculus. Derivation of linearized equations for analysis of stress and deformation in a continuous medium from basic physical laws. Applications of the laws of motion of a continuum to solids and fluids. *Final exam. Prereq: Mech 452 and Math 454. 3 sem hrs, spring.*

*Mech 599. Independent Study* 2-3 (R599)  
 Independent study and research at the graduate level. Topic established with the department head. *Final report. 4 to 9 sem hrs, fall or spring.*

#### Current Course Numbers

Mech 364  
 Mech 452  
 Mech 453  
 Mech 554

#### Previous Course Numbers

Mech 342 and 362  
 Mech 424 and 451  
 Mech 451  
 Mech 454



## SCIENCE

### *Courses Offered by the Engineering Sciences Division*

#### *Sci 350. Linear Systems Analysis*

1 (V350)

Modeling of physical systems. Joint study of mechanical, electrical, and thermal systems described by linear first and second order differential equations with constant coefficients. Electrical analogies, frequency response, introduction to Bode plots, and introduction to the analog computer. Includes operation of linear computer elements and readout devices, programming, selecting maximum values, magnitude scaling, time scaling, static check, and program check. Lab. *Final project.* *Prereq:* Phys 220; Math 251 or 260; El Engr 333 or 351; Mech 361. 2½ sem hrs, fall or spring. Administered by Department of Electrical Engineering.

#### *Sci 402. Professional Engineering Development*

0 (V402)

Review of mathematics, chemistry, physics, and engineering sciences in preparation for the Colorado Engineer-in-Training examination. Taking this exam is optional at end of course. *Prereq:* 1/C standing and a major in one of the Basic or Engineering Sciences. No sem hrs, spring. Administered by Department of Civil Engineering.

#### *Sci 451. Engineering Applications of Digital Computers*

1 (V451)

Tutorial instruction in the selection, analysis, and programming of digital computer solutions for advanced problems in the engineering sciences. *Final project.* *Prereq:* Completed or concurrently enrolled to complete any major administered by the Engineering Sciences Division. 2½ sem hrs, fall or 3, spring. Administered by Department of Astronautics and Computer Science.

#### *Sci 452. Bioengineering*

1 (V452)

Application of engineering techniques to solution of problems in the life sciences. Review of selected life science systems, mathematical model making, and design of instrumentation for physiological monitoring. *Final exam.* *Prereq:* El Engr 332 or 352. 2½ sem hrs, fall or spring. Administered by Department of Life Sciences in fall, Department of Electrical Engineering in spring.

#### *Sci 571. Space Propulsion Systems*

1 (V571)

Chemical and nuclear rockets, plasma jets, ion and photon drives, and magnetohydrodynamics. Power generation in space. *Final exam.* *Prereq:* Aero 461, Astro 451, and completed or enrolled in Phys 334. 3 sem hrs, spring. Administered by Department of Aeronautics.







## **DIVISION OF HUMANITIES**

The Division of Humanities offers courses in English, philosophy, fine arts, foreign languages, and history. Through these studies the cadet learns to write effectively, acquires an appreciation of literature and fine arts, develops an understanding of major philosophical problems, attains facility in understanding and speaking a foreign language, and acquires a knowledge of Western heritage and contemporary world civilization.

Through the completion of selected courses offered by the Division, a cadet may obtain a Major in History, Humanities, Military Art and Science, American Studies or General Studies. The Major in History is designed to provide an understanding of contemporary problems by a study of forces in the past which have shaped the world of the present. The Major in Humanities is offered to cadets who wish to increase their knowledge in all areas of the humanities. The Major in Military Art and Science provides study in depth of those areas which are applicable to the military profession, with special emphasis on the role of airpower. The Major in American Studies correlates studies in the economics, politics, history, literature, and general culture of the United States. The Major in General Studies allows cadets to broaden their knowledge in several areas with no particular specialization required.

## Department of English

### *Permanent Professor and Head of the Department*

COL. JESSE C. GATLIN, JR. — B.S., United States Military Academy; M.A., University of North Carolina; Ph.D., University of Denver

### *Tenure Associate Professors*

LT. COL. WILLIAM G. CLARK — B.A., M.A., State University of Iowa; Ph.D., University of Denver

LT. COL. MICHAEL J. MENDELSON — B.A., University of Pittsburgh; M.A., Trinity University; Ph.D., University of Colorado

LT. COL. THOMAS E. PEARSALL — A.B., Colgate University; M.A., University of Texas; Ph.D., University of Denver

MAJ. JOSEPH A. BERTHELOT — B.A., University of Western Ontario, Canada; M.A., University of Texas at El Paso; Ph.D.; University of Denver

### *Associate Professors*

LT. COL. JOHN R. GALT — B.A., M.A., Boston University; Ph.D., University of Denver

LT. COL. ROBERT B. WEAVER — B.S., United States Naval Academy; M.A., University of Texas

MAJ. OVID L. BAYLESS — B.A., M.A., Baylor University; Ph.D., University of Denver

MAJ. CHESTER F. CATON — B.A., Wayne University; M.A., Ph.D., Northwestern University

MAJ. JOHN I. KITCH, JR. — A.B., A.M., Ph.D., University of Illinois

MAJ. THOMAS E. LUCAS — M.A., University of Chicago; Ph.D., University of Denver

MAJ. WALTER R. McDONALD — B.A., M.A., Texas Technological College; Ph.D., University of Iowa

MAJ. JOHN C. PRATT — B.A., University of California at Berkeley; M.A., Columbia University; Ph.D., Princeton University

CAPT. PAUL W. ANDERSON — B.A., University of Notre Dame; M.S., University of Wisconsin; Ph.D., University of Denver

CAPT. ROBERT E. RYAN — B.A., M.A., Loyola University of Los Angeles; Ph.D., University of Southern California

### *Assistant Professors*

LT. COL. JOHN C. POWELL — B.S., United States Military Academy; M.A., Stanford University

LT. COL. EVERETTE TAYLOR — B.S., United States Military Academy; M.A., Columbia University

MAJ. SANFORD L. COHN — B.A., Brooklyn College; M.A., Columbia University

MAJ. JOSEPH M. DOUGHERTY — B.A., United States Military Academy; M.A., Vanderbilt University

MAJ. EARL L. GUNNELL — B.S., M.A., Brigham Young University

MAJ. CHARLES W. ROADES — B.S., United States Military Academy; M.A., University of Washington

CAPT. JOHN G. GIROD — B.A., University of Southwestern Louisiana; M.A., Louisiana State University

LT. JOHN K. CRANE — A.B., M.A., St. Louis University; Ph.D., Pennsylvania State University

### *Instructors*

MAJ. WILLIAM G. DWYER — B.A., Grove City College; M.A., Syracuse University

MAJ. JACK M. SHUTTLEWORTH — B.A., Ohio Wesleyan University; M.A., Stanford University

CAPT. DAVID K. MANN — B.A., St. Joseph's College of Indiana; M.A., University of Kansas

CAPT. DAVID C. WHITLOCK — B.G.E., University of Omaha; M.A., University of Colorado

LT. PAUL D. KNOKE — B.A., Virginia Military Institute; M.A., Ohio University  
 LT. WILLIAM E. McCARRON — B.A., College of the Holy Cross; M.A., Boston College  
 LT. JOHN R. PFEIFFER — A.B., M.A., University of Detroit

## ENGLISH

*Engl 111. Composition and Literature* 1 (J111)  
 Introduction to linguistics and rhetoric. Frequent practice in composition. Readings in contemporary American literature. *Final exam. 2½ sem hrs, fall.*

*Engl 112. Composition and Literature* 1 (J112)  
 Continuation of Engl 111 with readings from the Greeks to the Renaissance. *Final exam. Prereq: Engl 111. 3 sem hrs, spring.*

*Engl 112A. Composition and Literature* 1 (J112A)  
 Continuation of Engl 111 with readings from the Greeks to the Renaissance. *Final exam. Prereq: Engl 111. 2½ sem hrs, spring.*

*Engl 260. Speech* 1 (J260)  
 Instruction and practice in argumentation, debate, and persuasive speaking. *No final. 2½ sem hrs, fall or spring.*

*Engl 340. English Novel* 1 (J340)  
 Tutorial course in the reading of representative English novelists such as Defoe, Austen, Dickens, and Hardy. *Final exam. Prereq: Engl 112 or 112A. 2½ sem hrs, fall or spring.*

*Engl 352. American Literature* 1 (J352)  
 Reading of representative work of seven or eight American writers. *Final exam. Prereq: Engl 112 or 112A. 2½ sem hrs, fall.*

*Engl 353. Shakespeare* 1 (J353)  
 Intensive study of several of Shakespeare's plays not included in other literature courses. *Final exam. Prereq: Engl 112 or 112A. 3 sem hrs, spring.*

*Engl 430. Technical Writing and Speech* 1 (J430)  
 Application of the basic principles of clear communication in expository writing and speech. *No final. Prereq: Engl 112 or 112A; 1/C or 2/C standing. 2½ sem hrs, fall.*

*Engl 431. English Literature* 1 (J431)  
 Reading of major English writers not covered in other literature courses. *Final exam. Prereq: Engl 112 or 112A. 3 sem hrs, spring.*

*Engl 450. Composition and Speech* 1 (J450)  
 Practice in effective writing and speaking. *No final. Prereq: Engl 112 or 112A. 2½ sem hrs, fall.*

## HUMANITIES

*Hum 360. Classical Readings* 1 (J360H)  
 Tutorial course in the reading of Greek, Roman, and Northern European classics. *Final exam. Prereq: Engl 111 and 112. 2½ sem hrs, fall or spring.*

*Hum 406. Western World Literature* 1 (J406H)  
 Detailed analysis of selected western world masterpieces from the Renaissance through the moderns. *Final exam. Prereq: Engl 111 and 112. 3 sem hrs, spring.*

*Hum 441. Contemporary Drama* 1 (J441H)  
 Reading of about 15 modern American and European plays. *Final exam. Prereq: Engl 111 and 112. 3 sem hrs, spring.*

*Hum 442. Modern Literature* 1 (J442H)  
Intensive study of contemporary British, American, and continental literature with emphasis on the novel. *Final exam. Prereq: Engl 111 and 112. 3 sem hrs, spring.*

*Hum 461. Russian Literature* 1 (J461H)  
A study of representative writings by major Russian authors who have helped form the cultural heritage and shape the national character of the Russian people. *Final exam. Prereq: Soviet Studies Major or department permission. 2½ sem hrs, fall.*

*Hum 463. Far Eastern Literature* 1 (J463H)  
A study of mythology and culture as expressed in the writings of China, Japan, Korea, and other countries of Southeast Asia. *Final exam. Prereq: Far Eastern Studies Major or department permission. 2½ sem hrs, fall.*

*Hum 499. Independent Study* 1 (J499H)  
Study and research in the field of literature or creative writing. Subject and meetings arranged with the instructor. *No final. Prereq: Department permission. 2½ sem hrs, fall or spring.*

## **Department of Foreign Languages**

### **Permanent Professor and Head of the Department; Chairman of the Humanities Division**

COL. ALFONSE R. MIELE — A.B., Fordham College; M.A., Ph.D., Columbia University, Palms Académiques (*Currently serving as Assistant Dean and Faculty Executive*)

### **Acting Head of the Department and Associate Professor of Spanish**

LT. COL. FRANCIS W. MCINERNEY, JR. — B.S., United States Military Academy; M.A., University of Nebraska

### **Tenure Associate Professors of Foreign Languages**

LT. COL. GEORGE H. JANCZEWSKI — B.A., Wayne University; M.A., Ph.D., Georgetown University

LT. COL. FRANK J. ZAGORSKI — B.S., United States Military Academy; M.P.I.A., University of Pittsburgh

MAJ. LEO V. SOVINSKY — B.A., New York University; M.A., Columbia University

### **Associate Professors of French**

MAJ. PAUL T. COMEAU — B.A., Assumption College; M.A., Princeton University

MAJ. YVES R. GENESTE — B.S., University of Paris; B.A., M.A., Colorado College

### **Associate Professor of German**

LT. COL. PETER STRICKER — B.A., Mercer University; B.S., M.B.A., University of Akron

### **Associate Professors of Russian**

LT. COL. PETER H. DAVIDSON — B.S., Georgetown School of Foreign Service; M.A., Columbia University

LT. COL. WILLIAM L. ROCHE — B.S., University of Kentucky; M.A., Columbia University

MAJ. NICHOLAS P. VASLEF — B.A., University of Washington; M.A., Stanford University; Ph.D., Harvard University

### **Assistant Professor of Chinese**

MAJ. HSI-CHE LIN (Chinese Air Force) — Chinese Air Force Academy

### **Assistant Professors of French**

LT. COL. VICTOR T. METZ — A.B., M.A., West Virginia University

CAPT. PAUL J. AUNIS (French Air Force) — B.S., University of Rennes, France; Graduate, French Air Force Academy



### **Assistant Professors of German**

- LT. COL. MARLOWE B. SORGE — A.B., Indiana University; M.A., University of Kansas  
CAPT. HELMUT J. WUEST (German Air Force) — Abitur, Humanistisches Gymnasium, Miltenberg, Germany

### **Assistant Professor of Spanish**

- MAJ. SANTIAGO GUZMAN, JR. — B.S., United States Naval Academy; M.S., University of North Carolina

### **Instructors of French**

- CAPT. WILLIAM R. OUELLETTE — B.S., United States Air Force Academy; M.A., Syracuse University  
CAPT. KERMIT D. WILKINS — A.B., William Jewell College; M.S., University of Washington

### **Instructors of German**

- MAJ. CLAUDE J. GUINCHARD — B.A., M.A., San Francisco State College  
MAJ. WILLIAM T. WILSON — B.A., Texas A&M University; M.A., Stanford University

### **Instructors of Russian**

- CAPT. MINDAUGAS V. MIKOLAINIS — B.S., M.A., Fordham University  
LT. DAVID N. YOUNG — A.B., Princeton University; M.A., Columbia University

### **Instructors of Spanish**

- MAJ. JAVIER F. ACOSTA — B.A., San Diego State College; M.A., George Washington University  
MAJ. JUAN C. CASADO (Argentine Air Force) — B.A., Argentine Air Force Academy  
CAPT. O. GONZALEZ-BUENO (Mexican Air Force) — B.A., Mexican Military Academy  
CAPT. JUAN M. MEDINA (Spanish Air Force) — B.A., Spanish Air Force Academy  
CAPT. HECTOR A. NEGRONI — B.S., United States Air Force Academy; M.A., University of Puerto Rico

## **FOREIGN LANGUAGES**

### *For Lang 201-213:*

<i>Chi 201 — Elem Spoken Chinese I</i>	2 (K201C)
<i>Fr. 203 — Elem Spoken French I</i>	2 (K203F)
<i>Ger 205 — Elem Spoken German I</i>	2 (K205G)
<i>Russ 207 — Elem Spoken Russian I</i>	2 (K207R)
<i>Span 213 — Elem Spoken Spanish I</i>	2 (K213S)

Basic foreign language with emphasis on understanding and speaking. Inductive pattern drills. Structural analysis. Language lab supplements oral training and teaching. *Final exam. 4 sem hrs, fall. (See Supplementary Information — Note 1).*

### *For Lang 202-214:*

<i>Chi 202 — Elem Spoken Chinese II</i>	2 (K202C)
<i>Fr 204 — Elem Spoken French II</i>	2 (K204F)
<i>Ger 206 — Elem Spoken German II</i>	2 (K206G)
<i>Russ 208 — Elem Spoken Russian II</i>	2 (K208R)
<i>Span 214 — Elem Spoken Spanish II</i>	2 (K214S)

Continuation of For Lang 201-213. Includes some practice in reading and writing. Language lab. *Final exam. Prereq: For Lang 201-213. 5 sem hrs, spring.*

### *For Lang 233-251:*

<i>Fr 233 — Intermediate Spoken French I</i>	2 (K233F)
<i>Ger 235 — Intermediate Spoken German I</i>	2 (K235G)
<i>Russ 237 — Intermediate Spoken Russian I</i>	2 (K237R)
<i>Chi 251 — Intermediate Spoken Chinese I</i>	2 (K251C)

*Span. 243. Intermediate Spoken Spanish I* 2 (K243S)  
 Accelerated course intended for students who demonstrate a language proficiency beyond the elementary level. Designed to develop comprehension and conversational skills. Classroom work supplemented by language lab. Offered in lieu of For Lang 201-213. *Final exam. 4 sem hrs, fall. (See Supplementary Information — Note 1)*

*For Lang 234-252:*

<i>Fr 234 — Intermediate Spoken French II</i>	2 (K234F)
<i>Ger 236 — Intermediate Spoken German II</i>	2 (K236G)
<i>Russ 238 — Intermediate Spoken Russian II</i>	2 (K238R)
<i>Span 244 — Intermediate Spoken Spanish II</i>	2 (K244S)
<i>Chi 252 — Intermediate Spoken Chinese II</i>	2 (K252C)

Continuation of For Lang 233-251 with oral practice based on selected readings dealing with the culture and civilization of the countries concerned. *Final exam. Prereq: For Lang 233-251. 5 sem hrs, spring plus 2½ validation credit for Fr 333, Ger 335, Russ 337, Span 343, or Chi 331 depending on the language taken. (See Supplementary Information — Note 2)*

*For Lang 331-343:*

<i>Chi 331 — Advanced Spoken Chinese I</i>	1 (K331C)
<i>Fr 333 — Advanced Spoken French I</i>	1 (K333F)
<i>Ger 335 — Advanced Spoken German I</i>	1 (K335G)
<i>Russ 337 — Advanced Spoken Russian I</i>	1 (K337R)
<i>Span 343 — Advanced Spoken Spanish I</i>	1 (K343S)

Review of the essential elements of language structure. Conversational practice and pattern drills. Civilization and culture of the country or countries concerned. Selected readings. *Final exam. Prereq: Grade of C or better in For Lang 202-214 or the equivalent. 2½ sem hrs, fall or spring.*

*For Lang 332-344:*

<i>Chi 332 — Advanced Spoken Chinese II</i>	1 (K332C)
<i>Fr 334 — Advanced Spoken French II</i>	1 (K334F)
<i>Ger 336 — Advanced Spoken German II</i>	1 (K336G)
<i>Russ 338 — Advanced Spoken Russian II</i>	1 (K338R)
<i>Span 344 — Advanced Spoken Spanish II</i>	1 (K344S)

Continuation of For Lang 331-343. *Final exam. Prereq: Completion of For Lang 331-343 or 234-252 with C or better average. 2½ sem hrs, fall or spring.*

*For Lang 431-443:*

<i>Chi 431 — Chinese Reading Course I</i>	1 (K431C)
<i>Fr 433 — French Reading Course I</i>	1 (K433F)
<i>Ger 435 — German Reading Course I</i>	1 (K435G)
<i>Russ 437 — Russian Reading Course I</i>	1 (K437R)
<i>Span 443 — Spanish Reading Course I</i>	1 (K443S)

Tutorial course for the cooperative master's programs designed to give the student reading and translation skills in a language as a tool for research. Meetings arranged at times convenient to instructor and student. *No final. Prereq: Department permission. 1½ sem hrs, fall.*

*For Lang 432-444:*

<i>Chi 432 — Chinese Reading Course II</i>	1 (K432C)
<i>Fr 434 — French Reading Course II</i>	1 (K434F)
<i>Ger 436 — German Reading Course II</i>	1 (K436G)
<i>Russ 438 — Russian Reading Course II</i>	1 (K438R)
<i>Span 444 — Spanish Reading Course II</i>	1 (K444S)

Tutorial course for the cooperative master's programs designed to give the student reading and translation skills in a language as a tool of research. Meetings arranged at times convenient to instructor and student. *No final.* *Prereq:* Department permission. 1½ sem hrs, spring.

*For Lang 471-479:*

<i>Chi 471 — Advanced Area Chinese</i>	2 (K471C)
<i>Fr 473 — Advanced Area French</i>	2 (K473F)
<i>Ger 475 — Advanced Area German</i>	2 (K475G)
<i>Russ 477 — Advanced Area Russian</i>	2 (K477R)
<i>Span 479 — Advanced Area Spanish</i>	2 (K479S)

A special course for Area Studies Majors in the language concerned. A brief review of essentials of the language structure. Readings and conversations in the fields of contemporary literature, socio-economic and historical developments, and discussions of current issues in the respective cultural areas. *Final exam.* *Prereq:* Completion of basic course with a grade of B or better, or its equivalent in transfer or validation credit. 5 sem hrs, fall or spring. (See Supplementary Information — Notes 2 and 3)

*For Lang 499. Independent Study* 1 (K499)

Study in depth in an area mutually acceptable to instructor and student. *No final.* *Prereq:* Department permission. 2½ sem hrs, fall or spring.

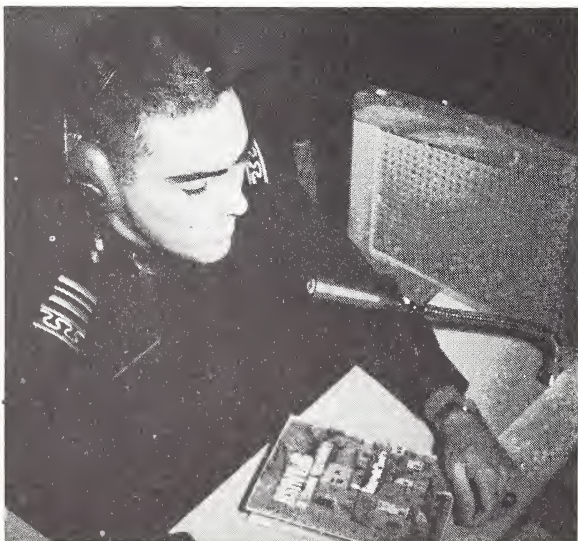
### SUPPLEMENTARY INFORMATION

**GENERAL:** All cadets who have completed one or more years of a foreign language in high school will take a language placement examination in that language. The results of this examination, plus previous language experience, will determine whether a cadet will be enrolled in a basic or intermediate level course, or will receive validation credit to fulfill the basic language requirement. Other factors, such as the cadet's major and his personal preference, are considered in assigning cadets to a specific language.

**NOTE 1:** All cadets who have completed their basic language requirement may not register for another basic or intermediate language course without departmental approval. These cadets must take the course on a *substitute* basis and must complete *both* semesters.

**NOTE 2:** Cadets who complete For Lang 233-251 and 234-252 intermediate courses are ineligible for For Lang 471-479 and must enroll in For Lang 332-344 in order to satisfy any additional language requirements.

**NOTE 3:** Cadets who complete the basic course with a grade of "C" must take both semesters of the For Lang 331-343 and For Lang 332-344 series, instead of For Lang 471-479, in order to fulfill the language requirement for their area major.



## Department of History

### *Permanent Professor and Head of the Department*

COL. ALFRED F. HURLEY — B.A., St. John's University; M.A., Ph.D., Princeton University

### *Permanent Professor and Director of the Library*

COL. GEORGE V. FAGAN — B.S., M.A., Temple University; M.A.L.S., University of Denver; Ph.D., University of Pennsylvania

### *Tenure Associate Professors*

LT. COL. JOHN J. JONES — A.B., Nebraska Wesleyan University; M.A., University of Missouri

LT. COL. VICTOR D. SUTCH — B.A., Olivet College; M.A., Western Reserve University; Ph.D., University of Colorado

MAJ. PHILIP M. FLAMMER — B.A., Utah State University; M.A., George Washington University; Ph.D., Yale University

MAJ. OAKAH L. JONES, JR. — B.S., United States Naval Academy; M.A., Ph.D., University of Oklahoma

MAJ. JOHN SCHLIGHT — B.A., St. Vincent College; M.A., Fordham University; M.A., Ph.D., Princeton University

### *Associate Professors*

LT. COL. JAMES M. BOYLE — B.A., University of Santa Clara; M.A., Stanford University; Ph.D., St. Louis University

LT. COL. ALLEN F. CHEW — B.A., M.A., George Washington University; Ph.D., Georgetown University

LT. COL. GEORGE W. COLLINS — B.S., M.A., Northwestern University; Ph.D., University of Colorado

LT. COL. HENRY G. HOSTETTER — B.A., Lebanon Valley College; M.A., Pennsylvania State University; Ph.D., University of Colorado

LT. COL. JOHN H. SCRIVNER, JR. — B.A., University of Kansas; M.A., University of Oklahoma

MAJ. DONALD D. BRADEN — B.A., M.A., University of Kentucky; Ph.D., University of Southern California

MAJ. THEODORE J. FINNEGAN — B.A., M.A., University of New Hampshire

MAJ. DAVID I. FOLKMAN, JR. — B.A., Brigham Young University; M.A., Ph.D., University of Utah

MAJ. WILLIAM GEFFEN — B.A., University of California; M.A., Stanford University

### *Assistant Professors*

LT. COL. WATT G. HILL, JR. — B.A., Whittier College; M.A., St. Mary's University

LT. COL. THOMAS A. JULIAN — B.S., United States Naval Academy; M.A., D.S.Sc., Syracuse University

LT. COL. THOMAS D. WADE — A.B., M.Litt., University of Pittsburgh

MAJ. JACK S. BALLARD — B.S.E., University of Arkansas; M.A., University of Southern California

MAJ. PHILIP D. CAINE — B.A., University of Denver; M.A., Ph.D., Stanford University

MAJ. RICHARD D. KENNEDY — B.A., M.Ed., Springfield College; M.A., Loyola University

MAJ. ROBERT C. LEONARD — B.A., Coe College; M.A., West Virginia University

MAJ. BYNUM E. WEATHERS, JR. — B.A., M.A., University of North Carolina

MAJ. DONALD E. WILSON — B.A., University of Louisville; M.A., West Virginia University

SQDN. LDR. GERALD A. W. WORSELL — B.A., Liverpool University; M.Ed., London University

### *Instructors*

MAJ. DAN C. ALLEN — B.A., University of Arkansas; M.A., Ohio State University

MAJ. THOMAS A. FABYANIC — A.B., Syracuse University; M.A., St. Louis University

MAJ. DONALD M. GOLDSTEIN — B.A., M.A., University of Maryland; M.S., George Washington University



MAJ. DONALD K. MANGELS — B.S.C., University of Iowa; M.A., University of Oklahoma

MAJ. JAMES R. PRALLE — B.A., Ohio Wesleyan University; M.A., University of Denver

CAPT. ROBERT J. COOPER — B.A., Rhode Island College; M.A., Indiana University

CAPT. JOHN H. FLANNAGAN, JR. — A.B., Holy Cross College; M.A., University of Detroit

CAPT. DONALD W. NELSON — B.A., Lawrence College; M.A., University of Minnesota

CAPT. CHARLES A. NICHOLSON — B.A., Wayland College; M.A., Texas Christian University

CAPT. ALAN M. OSUR — B.A., Rutgers University; M.A., University of Connecticut

CAPT. CARL W. REDDEL — B.S., Drake University; M.A., Syracuse University

## HISTORY

*Hist 101. History of the United States* 1 (M101)  
From the colonial period through World War II. Emphasizes selected events to explain how the United States and its citizens rose from colonial status to world leadership. *Final exam. 2½ sem hrs, fall.*

*Hist 104. World History* 1 (M104)  
Main trends in world history from 1500 to the present. Emphasizes the emergence of Western Europe to a position of world dominance through the 19th century. Introduction to predominant characteristics of Latin-American, Middle Eastern, African, and Far Eastern civilizations. *Final exam. 3 sem hrs, spring.*

*Hist 203. Military History* 1 (M203)  
Military affairs from antiquity through the 19th century. Focus on the societal, technological, organizational, and theoretical aspects. *Final exam. Prereq: Hist 101 and 104. 2½ sem hrs, fall.*

*Hist 204. Air Power and 20th Century Warfare* 1 (M204)  
The evolution of air warfare against a background of military affairs during the 20th century. Air power viewed as the central development of modern war. *Final exam. Prereq: Hist 203. 3 sem hrs, spring.*

*Hist 332. United States Diplomatic History* 1 (M332)  
Emphasizes emergence of the United States as a world power and the associated problems. Examination of diplomatic policies and their objectives and the novel factors which have influenced the conduct of diplomacy. *Final exam. Prereq: Hist 101 and 104. 3 sem hrs, spring.*

*Hist 341. History of Latin America* 1 (M341)  
The discovery, conquest, and growth of Spanish and Portuguese America. Emphasizes political, social, economic, and cultural institutions since the wars of independence with particular stress on 20th century problems. *Final exam. Prereq: Hist 101 and 104. 3 sem hrs, spring.*

*Hist 343. History of the Far East* 1 (M343)  
Modern history of East Asia with emphasis on China and Japan. The fundamental cultural developments; implications of contemporary tensions; the political, social, and economic results of 19th and 20th century relationships with western powers. *Final exam. Prereq: Hist 101 and 104. 2½ sem hrs, fall.*

*Hist 345. European Diplomatic History* 1 (M345)  
From the diplomatic settlements of the Napoleonic wars to the mid-20th century. Emphasizes the backgrounds and origins of the First and Second World Wars. Attention to such personalities as Bismarck, Kaiser William II, Mussolini, and Hitler. *Final exam. Prereq: Hist 101 and 104. 2½ sem hrs, fall.*

*Hist 346. Russian History to the Modern Era* 1 (M346)  
Survey of Russian domestic and foreign affairs from the appearance of the Norsemen in the 9th century to the beginning of the 19th century. Emphasis on aspects of political and social development with enduring effects on Russia and relations with her neighbors. *Final exam. Prereq: Hist 101 and 104. 2½ sem hrs, fall.*

*Hist 347. Modern Russian History* 1 (M347)  
Political and social development of Russia from 1801 to the present. Historical perspective of the Soviet regime illustrating pre-Marxist factors which continue to affect Russian policies. *Final exam. Prereq: Hist 101 and 104. Hist 346, recommended but not required. 3 sem hrs, spring.*

*Hist 382. History of Science* 1 (M382)  
Discovery and development of scientific ideas and methods from ancient times. Particular attention to the period from the 17th century to the early 20th century. Emphasizes leading conceptual developments, interrelationships of the sciences, and the role of science in society. *Final exam. Prereq: Hist 101 and 104. 3 sem hrs, spring.*

*Hist 394. History of England* 1 (M394)  
The political and social development of England with emphasis on the period between the 15th and early 19th centuries. The effects on modern English political institutions of the politico-religious struggle and the Industrial Revolution. *Final exam. Prereq: Hist 101 and 104. 2½ sem hrs, spring.*

*Hist 438. Western Institutions and Ideas* 1 (M438)  
Institutions and currents of thought from the early Middle Ages to the French Revolution of 1789 which have had a major influence on western history: Christianity, humanism, nationalism, the enlightenment, scientific method, capitalism, education, and the nation-state. *Final exam. Prereq: Hist 101 and 104. 3 sem hrs, spring.*

*Hist 460. Military Ideas and Institutions* 2 (M460)  
The interrelationship of military theory and institutions, and society, as reflected in selected military writing from Machiavelli to the present. Particular emphasis on the theories of war as a science or art, civil-military relations, limited versus unlimited war, the citizen versus the professional army, the offensive versus the defensive, the role of battle in warfare, and wars of position versus wars of maneuver. *No final. Prereq: Hist 203 and 204. 5 sem hrs, fall.*

*Hist 463. Unconventional Warfare* 1 (M463)  
Evolution, theory and practice of insurgent and revolutionary warfare throughout the world with special attention given to Southeast Asia. Unconventional warfare studied in terms of historical perspective, major philosophies involved and actual insurgencies. Examination of counter-insurgency operations in various areas and circumstances. Taught in conjunction with the Geography and Political Science departments. *No final. Prereq: Hist 203 and 204. 3 sem hrs, spring.*

*Hist 490. Employment of Air Power* 1 (M490)  
The evolution of air power doctrine and the employment of aircraft as a weapons system from World War I to the present. U.S. air power doctrine is studied in depth. *Research paper. Prereq: Hist 203 and 204. 2½ sem hrs, fall.*

*Hist 492. Great Issues in American History* 1 (M492)  
Events, individuals, and movements which have shaped the course of history including the following: constitutional development, Hamilton vs Jefferson,

the reconstruction period, progressivism, the new deal. *Final exam. Prereq: Hist 101 and 104. 2½ sem hrs, spring.*

*Hist 499. Independent Study*

1 (M499)

Historical method and research. Areas selected by instructor depend on student interest. *No final. Prereq: History Major or department permission. 2½ sem hrs, fall or spring.*

*Hist 553. Colloquium: Diplomatic History*

1 (M553)

A reading seminar in the diplomatic history of either the United States or Europe depending on the cadet's area of concentration. Acquaints the cadet with major secondary works relating to the questions of military leadership and professionalism, preparedness, security, economics and technology. *Final exam. Prereq: Department permission. 3 sem hrs, fall.*

*Hist 562. Colloquium: Military History of the United States*

1 (M562)

A reading seminar which examines the interaction of U. S. social and military ideas and institutions from the American Revolution to the present. Acquaints the cadet with major secondary works relating to the questions of military leadership and professionalism, preparedness, security, economics and technology. *Final exam. Prereq: Department permission. 3 sem hrs, spring.*

*Hist 564. Colloquium: Area Military History*

1 (M564)

A reading seminar in military history of the area chosen by the cadet for concentration. Areas include Western Europe, the Far East, Latin America, and Russia. Provides a critical analysis of major secondary works relating to the reciprocal influence of military and social ideas and institutions. *Final exam. Prereq: Department permission. 3 sem hrs, spring.*

*Current Course Numbers*

Hist 104  
Hist 460

*Previous Course Numbers*

Hist 102  
Hist 355 and 464

## **Department of Philosophy and Fine Arts**

### **Permanent Professor and Head of the Department**

COL. MALHAM M. WAKIN — A.B., University of Notre Dame; A.M., State University of New York; Ph.D., University of Southern California

### **Associate Professor of Philosophy**

MAJ. ELDON L. STEVENS — B.A., M.A., University of Minnesota; Ph.D., University of Colorado

### **Assistant Professors of Philosophy**

CAPT. JAMES D. MCCARTHY — A.B., University of Notre Dame; M.A., Ohio State University

LT. ROBERT C. SCHARFF — A.B., University of Illinois; M.A., Northwestern University

### **Assistant Professors of Fine Arts**

CAPT. JAMES H. CONELY, JR. — B.A.E., M.Ed., University of Florida; Ed.D., Columbia University

CAPT. CARLIN J. KIELCHESKI — B.S., M.E., Wisconsin State University; M.A., Colorado College

### **Instructors of Philosophy**

LT. JAMES T. JENKINS III — B.S., M.A., Arizona State University

LT. THOMAS G. NEWELL — B.A., Willamette University; M.A., University of Michigan

## PHILOSOPHY

*Philos 210. Great Philosophers* 0 (J210P)

Introduction to Western philosophic systems through extensive study of three or four major philosophers. Problems in the theory of knowledge, the human condition, and theories of reality as reflected in the works of these thinkers. *Final exam. 1 sem hr, winter.*

*Philos 330. Introduction to the Philosophy of Science* 1 (J330P)

Analysis of basic assumptions of science, nature of scientific method, nature of mathematics, status of scientific laws, and concepts of theory construction and scientific explanation. *Final exam. 2½ sem hrs, fall.*

*Philos 350. Philosophical Analysis* 1 (J350P)

Classical and contemporary techniques of conceptual analysis as reflected in the traditional problems of metaphysics, epistemology, and the philosophy of religion. The philosophical method and problems of linguistic analysis, meaning, and truth are investigated. *Final exam. 2½ sem hrs, fall.*

*Philos 370. Introduction to Symbolic Logic* 1 (J370P)

Propositional calculus, formal languages, truth tables, and proofs. Predicate calculus, models, axioms, quantifiers, and equality. Definitions. Boolean algebra. *Final exam. Prereq: Math 102, 131 or 161; completed or enrolled in Comp Sci 230, 240 or 254. 2½ sem hrs, spring.*

*Philos 382. American Philosophy* 1 (J382P)

An examination of the philosophic background of Puritanism, the Revolutionary period, transcendentalism, evolutionism, and pragmatism with special reference to the thought of major American philosophers such as Pierce, James, Royce, Santayana, Dewey, and Whitehead. *2½ sem hrs, fall 1968; 3, spring beginning 1970.*

*Philos 400. Great Religions of the World* 1 (J400P)

A comparative and critical study of the world's great religions which emphasizes the relation of religion to morality; the nature of religious aspirations; the spiritual influence of religion upon culture and society; the sacred scriptures; the concept of God, salvation, evil, and the afterlife. Includes a survey of religious thought and practice through a study of Christianity, Buddhism, Judaism, Hinduism, Confucianism, and Islam. *Final exam. 2½ sem hrs, fall or spring.*

*Philos 440. Ethics* 1 (J440P)

Study of classical and contemporary ethics. *Final exam. 2½ sem hrs, fall or spring.*

*Philos 499. Independent Study* 1 (J499X)

Philosophical research guided by an instructor. Topics and meetings arranged with the instructor. *No final. Prereq: Department permission. 2½ sem hrs, fall or spring.*

## FINE ARTS

*Fine Arts 451. Introduction to the Arts* 1 (J451F)

Discussion and analysis of major art concepts, artists, and styles. Studio projects in painting, sculpture, and graphics. *Final exam. 2½ sem hrs, fall or 3, spring. (Not offered fall 1968.)*

*Fine Arts 458. Music Appreciation* 1 (J458F)

A chronological survey of musical forms and styles and a study of major works by representative composers. *Final exam. 2½ sem hrs, fall or 3, spring.*

*Fine Arts 460. Fine Arts Laboratory* 1 (J460F)

Introductory projects in design, graphics, painting, and sculpture. Media



explored are graphics (woodcut and etching), painting (oils and synthetics), sculpture (wood, stone, bronze, and direct metal). *Final exam. Prereq: Fine Arts 451, 473, or 475, 3 sem hrs, spring.*

*Fine Arts 473. The Arts in America* 2 (J473F)  
Survey from the Colonial Period to the present. Considers uniquely American aspects of architecture, sculpture, painting, and music with occasional reference to graphics, visual communication, and stage design. *Final exam. 5 sem hrs, spring 1969 only; 5, fall thereafter.*

*Fine Arts 499. Independent Study* 1 (J499X)  
Independent study in the field of art or music. Subject and meetings arranged with the instructor. *No final. Prereq: Department permission. 2½ sem hrs, fall or spring.*



## AREA STUDIES

*Interdisciplinary courses administered by the individual committees on area study.*

*Area Stu 351. The American Identity* 1 (V351A)  
Introduction to interdepartmental study. Considers specific problems of creating and defining an American national identity in such areas as colonialism, revolution, expansion, the Civil War, the growth of technology, and the arts. *Final exam. 2½ sem hrs, fall. Administered by Department of History.*

*Area Stu 430. Seminar in Soviet Issues* 1 (V430A)  
An interdisciplinary examination of a particular topic in Soviet affairs. Topics changed annually. *No final. Prereq: Soviet Studies Major. 3 sem hrs, spring. Administered by Department of Geography.*

*Area Stu 440. Seminar in Latin American Issues* 1 (V440A)  
An interdisciplinary examination of a particular topic in Latin American affairs. Topics changed annually. *No final. Prereq: Latin American Studies Major. 3 sem hrs, spring. Administered by Department of History.*

*Area Stu 444. Seminar in American Issues* 1 (V444A)  
Interdepartmental study in depth of issues affecting American life. Topics changed annually. *No final. Prereq: American Studies Major. 3 sem hrs, spring. Administered by Department of English.*

*Area Stu 450. Seminar in Western European Issues* 1 (V450A)  
An interdisciplinary examination of a particular topic in Western European affairs. Topics changed annually. *No final. Prereq: Western European Studies Major. 3 sem hrs, spring. Administered by Department of Political Science.*

*Area Stu 460. Seminar in Far Eastern Issues* 1 (V460A)  
An interdisciplinary examination of a particular topic in Far Eastern affairs. Topics changed annually. *No final. Prereq: Far Eastern Studies Major. 3 sem hrs, spring. Administered by Department of Political Science.*

### Current Course Numbers

Area Stu 351  
Area Stu 444

### Previous Course Numbers

Amer Stu 351  
Amer Stu 444

## **DIVISION OF SOCIAL SCIENCES**

The Division of Social Sciences offers courses in anthropology, area studies, economics, geography, law, management, political science, psychology, and sociology. These courses are designed to provide an understanding of national and international affairs, to furnish a background for handling problems in management and human affairs, and to provide a basis for further development as a military leader in the modern world.

Through the completion of selected courses offered by the division, a cadet may obtain a Major in Area Studies (Far Eastern, Latin American, Soviet, or Western European), Economics, Engineering Management, Geography, International Affairs, Political Sciences, or Psychology. These majors are recommended for cadets who contemplate future graduate work in any of these fields or who wish a career in operations, planning, programming, intelligence, politico-military affairs, foreign representation, management, or other staff positions that require a broad intellectual background.

The Engineering Management and International Affairs Majors are interdepartmental majors that also offer cooperative graduate programs with civilian universities.

### **Department of Economics**

#### ***Permanent Professor and Head of the Department; Chairman of the Social Sciences Division***

COL. WAYNE A. YEOMAN — B.S., United States Military Academy; M.B.A., Harvard University

#### ***Tenure Associate Professors***

LT. COL. ROBERT L. ABLE — B.S., University of Louisville; M.B.A., Ph.D., University of Kentucky

MAJ. EDWARD L. CLAIBORN — B.S., University of Idaho; M.A., Ph.D., Princeton University

MAJ. EDWARD B. OPPERMAN — B.S., United States Naval Academy; M.B.A., Air Force Institute of Technology; Ph.D., Indiana University

#### ***Associate Professors***

MAJ. THEODORE K. GRAVES — B.S., United States Naval Academy; M.S.I.E., University of Southern California

MAJ. JAMES M. L. KARNS — B.S., United States Military Academy; M.A., University of Oklahoma

MAJ. WADE R. KILBRIDE — B.S., Regis College; M.A., University of Texas

LT. DONALD R. PLANE — M.E., University of Cincinnati; M.B.A., D.B.A., Indiana University

#### ***Assistant Professors***

MAJ. PATRICK A. MARTINELLI — B.S., Georgetown University; M.B.A., Ph.D., Ohio State University

MAJ. RICHARD M. OVESON — B.A., Brigham Young University; M.P.A., Harvard University

CAPT. DANIEL E. STRAYER — B.A., Ohio Wesleyan University; M.B.A., Ohio State University

LT. JAY L. TONTZ — B.A., Denison University; M.S., Cornell University; Ph.D., University of North Carolina

### Instructors

MAJ. RICHARD D. DUCKWORTH — B.S.C., Texas Christian University; M.S.E., Baylor University

MAJ. HERMAN L. GILSTER — B.S., United States Military Academy; M.B.A., University of Denver; M.P.A., Ph.D., Harvard University

MAJ. MICHAEL K. MOLITORIS, JR. — B.S., United States Military Academy; M.S., Rensselaer Polytechnic Institute

CAPT. ROBERT J. BEATTY — B.M.E., Rensselaer Polytechnic Institute; M.B.A., Ohio State University

CAPT. GEORGE K. BOYER — B.S., Colorado State University; M.S., University of California at Berkeley

CAPT. ROBERT G. GOUGH — B.S., Lehigh University; M.B.A., University of Chicago

CAPT. JERRY J. JASINOWSKI — A.B., Indiana University; M.A., Columbia University

CAPT. JOHN A. NEHRING — B.S., United States Air Force Academy; M.A., Georgetown University

CAPT. EDMUND B. STEWART — B.A., University of the South; M.A., University of South Carolina

CAPT. LLOYD WOODMAN, JR. — B.S., M.B.A., University of Arkansas

LT. ROBERT D. BELAND — B.A., University of Georgia; M.A., University of Virginia

LT. FRANK T. OTTERSTROM — B.S., M.A., Brigham Young University

LT. JAMES L. PLUMMER — B.A., M.A., University of Southern California

### ECONOMICS

#### *Econ 200. Economic Principles and Problems* 2 (G200)

Economic principles and problems relevant to the mixed enterprise system of the United States. Includes national income accounting, theory of national income determination, income stabilization policy, theory of price determination, international trade, and economic analysis of defense decision making. *Final exam. 5 sem hrs, fall or spring.*

#### *Econ 330. Principles of Accounting* 1 (G330)

Fundamental accounting concepts and techniques necessary for administration of an organization. Includes analysis of transactions, classification and recording of data, amortization of assets, treatment of taxes, and other elements of an accounting system for the measurement of operating results and financial condition. *Final exam. 2½ sem hrs, fall or spring.*

#### *Econ 350. International Economics* 1 (G350)

Economic aspects of international relations. Includes the theory of international trade, relationships between national currencies under alternative international monetary systems, the balance of payments, commercial policy, and economic warfare. *Final exam. Prereq: Econ 200 or 311. 2½ sem hrs, fall or spring.*

#### *Econ 373. Public Finance* 1 (G373)

Nature of the private and public sectors; theory of public expenditures; nature of the budget system; sources of public revenues, principles and problems of taxation, personal income taxation, corporate income taxation, state and local taxation; theory of expenditure taxation. *Final exam. Prereq: Econ 200 or 311. 2½ sem hrs, fall.*

#### *Econ 375. Monetary Economics* 1 (G375)

History and development of the banking system and other financial institutions. Analysis of the determinants of interest rates and credit availability with special emphasis on current issues of monetary policy. *Final exam. Prereq: Econ 200 or 311. 3 sem hrs, spring.*

*Econ 430. Quantitative Decision Methods* 1 (G430)  
Decision theory, model building, and multiple regression analysis with special emphasis on applications to defense management decisions. *Final exam. Prereq: Math 232 or Econ 431. 2½ sem hrs, fall or spring.*

*Econ 432. Operations Analysis* 1 (G432)  
Methods of operations analysis including inventory models, linear programming, queuing theory, replacement models, and cost effectiveness. *Final exam. Prereq: Math 232 or Econ 431; also Econ 430 for Engineering Management Majors and Management Master's Majors. 2½ sem hrs, fall or spring.*

*Econ 433. Price Theory* 1 (G433)  
Traditional microeconomic theory emphasizing the principles of product and factor pricing, allocation and employment of resources, and the implications of varying market structures. Investigates the usefulness of price theory in decision making. *Final exam. Prereq: Econ 200 or 311. 2½ sem hrs, fall.*

*Econ 435. Managerial Economics* 1 (G435)  
Integration of the analytical concepts of price theory, statistics, and operations analysis. Case study demonstration of these concepts to problems of management in situations of decision making. *Final exam. Prereq: Econ 430. 2½ sem hrs, fall.*

*Econ 439. Production Management* 1 (G439)  
Discussion of a production system and its relation to the defense organization. Depending upon the background of cadets enrolled, topics from the following list are studied: functions of production management, location theory, materials handling, methods improvement, PERT, waiting line models, programming methods, quality control, inventory control, and simulation. *No final. Prereq: Math 232 or Econ 431; also Econ 432 for Engineering Management Majors and Management Master's Majors. 2½ sem hrs, fall or spring.*

*Econ 451. Economic Problems of USSR and Eastern Europe* 1 (G451)  
Underlying assumptions, principles, and organization of the Soviet and East European economies. Historical and ideological backgrounds, industry, labor, resources, trade, transportation, and problems of planning and rapid industrialization. Emphasizes the agricultural sectors, role of the industrial manager, and the problem of incentives. Comparison of selected Soviet-type economic models. *Final exam. Prereq: Econ 200 or 311. 2½ sem hrs, fall.*

*Econ 452. Economic Problems of Developing Areas* 1 (G452)  
Theory and policy of economic development. Examination of classical and modern theories of development. The problems of accelerating development in developing countries and maintaining growth in advanced economies. *Final exam. Prereq: Econ 200 or 311. 3 sem hrs, spring.*

*Econ 454. European Economic Problems* 1 (G454)  
A theoretical and empirical investigation of selected post-1945 European economic problems. Major emphasis is on the role of the European Economic Community versus the other European countries and the United States. Covers the approaches by Europe and the United States toward the common problems of inflation, unemployment, economic growth, and social control. *Final exam. Prereq: Econ 200 or 311. 3 sem hrs, spring.*

*Econ 456. Macroeconomic Theory* 1 (G456)  
Analysis of the determination of level of national income and employment in terms of national income accounting and aggregative theory. Treats classical, Keynesian, and neo-Keynesian theories of income level, fluctuation,



and growth. Evaluation of various economic policies designed to promote economic stability. *Final exam. Prereq: Econ 200 or 311. 3 sem hrs, spring*

*Econ 458. Quantitative Economic Theory* 1 (G458)

Application of quantitative tools of microeconomic theory. Includes theory of the firm, theory of the consumer, and how these areas can be used to analyze defense problems. *Final exam. Prereq: Math 162 or 202 and Econ 200 or 311. 3 sem hrs, spring.*

*Econ 465. Introduction to Econometrics* 1 (G465)

Econometric model building, data collection, and statistical analysis including descriptive statistics, probability, statistical inference, and various bivariate and multivariate statistical techniques. Emphasizes the application of these techniques to original empirical problems. *Final exam. Prereq: Econ 200 or 311 and 1/C standing. 2½ sem hrs, fall.*

*Econ 466. Seminar in Econometrics* 1 (G466)

Continues development of model building and analytical tools and stresses their application to economic problems. Emphasizes individual and original research. *No final. Prereq: Econ 465. 3 sem hrs, spring.*

*Econ 473. Managerial Accounting and Finance* 2 (G473)

In-depth discussion of accounting techniques and practices as a tool to aid decision making. Includes financial statement analysis, basic cost accounting, effect of price-level changes, and internal control and reports. The analytical tools of the financial manager are developed to include various concepts of capital budgeting and cost-of-capital computations, theory of the optimum capital structure of the firm, internal and external sources of funds, and management and control of assets. Case studies used to demonstrate practical application of the tools. *Final exam. Prereq: Econ 330; also 1/C standing for Engineering Management Majors. 5 sem hrs, fall.*

*Econ. 477. Defense Economics* 2 (G477)

Microeconomic methodology of systems analysis and cost effectiveness as involved in defense decision making; macroeconomic implications of the cold war, active warfare, defense R&D expenditures, arms control and disarmament. Applied research in areas of defense economics with a minimum of one three-day field trip required. *Final exam. Prereq: 1/C standing; completed or enrolled in Econ 430 or 465. 5 sem hrs, fall.*

*Econ 479. Policy Issues in Contemporary Economics* 2 (G479)

Application of economic theory to contemporary economic issues and policies. Includes methodology, income and employment, distribution of income, industrial organization and pricing, public versus private sectors, economic growth, comparative economic systems and philosophies. *No final. Prereq: Econ 433 and 456; 1/C standing. 5 sem hrs, spring.*

*Econ 482. Investment Analysis* 1 (G482)

Life insurance and investment media — bonds, preferred stock, common stock, investment companies (mutual funds), commodities, and real estate — studying the characteristics, methods of analysis, and investment merit of each. Includes practical aspects of investing such as security exchanges, buying and selling securities, using a broker, income tax considerations, individual investment program, and use of trusts. *No final. Prereq: Econ 200 or 311. 2½ sem hrs, fall or spring.*

*Econ 499. Independent Study* 1-2 (G499)

Tutorial investigation of a specific area of economics or management. *No final. 2 to 5 sem hrs, fall or spring.*

*Econ 534. Seminar in Logistics Management* 1 (G534)

Application of quantitative techniques to logistics management including

topics such as inventory and production control models, forecasting methods, logistics simulation, and allocation techniques. *No final. Prereq: 1/C standing; Econ 432 or permission of course director. 3 sem hrs, spring.*

**Econ 536. Seminar in Management Theory and Analysis** 1 (G536)  
Capstone course for Engineering Management Major and Master's program. Tools and techniques developed in previous courses are given practical application through case analysis of operating problems faced by top management. Evolution of management thought is traced and considered in light of current trends to develop an eclectic conception of management theory. Review of large segment of the literature of management. *No final exam. Prereq: 1/C standing. 3 sem hrs, spring.*

**Econ 551. Advanced Economic Theory I** 1 (G551)  
Scope and method of economic analysis, historical perspective of major contributions, emphasis on rigorous analysis of micro-economics including demand theory and production theory. *Final exam. Prereq: Econ 433 or 458. 3 sem hrs, fall.*

**Econ 552. Advanced Economic Theory II** 2 (G552)  
Emphasizes modern developments in both micro and macroeconomic theory, general equilibrium analysis, and welfare economics. *Final exam. Prereq: Econ 456 and 551. 4 sem hrs, spring.*

**Econ 553. Economic Development** 1 (G553)  
Examines the determinants of sustained economic growth according to the development theories of classical neo-classical, Keynesian, and post-Keynesian schools. Analyzes current economic developmental factors (emphasizing the maintenance and/or acceleration of economic growth) that influence the economic and military alignment of developing areas. *Final exam. Prereq: Econ 350. 2½ sem hrs, fall.*

**Econ 599. Independent Study** 1-2 (G599)  
Tutorial investigation of a specific area of economics or management in greater depth than in Econ 499. *No final. 2 to 5 sem hrs, fall or spring.*

#### **Current Course Numbers**

Econ 373  
Econ 473

#### **Previous Course Numbers**

Econ 372  
Econ 332 and 437

## **Department of Geography**

### **Permanent Professor and Head of the Department**

COL. ROBERT G. TAYLOR — B.A., University of California at Los Angeles; M.A., Ph.D., Indiana University

### **Associate Professors**

COL. JOSEPH R. CASTELLI — B.S., United States Military Academy; M.A., University of Oklahoma

LT. COL. WILLIAM J. ACKER — B.S., Purdue University; M.S., University of Kansas; M.A., Syracuse University

LT. COL. WILLIAM M. ROBERTS, JR. — B.A., M.A., State University of Iowa; Ph.D., University of Washington

MAJ. MAYNARD W. DOW — B.A., United States Naval Academy; M.A., Rutgers University; Ph.D., Syracuse University

MAJ. WALTER N. DUFFETT — A.B., San Diego State College; M.A., Ohio State University

### Assistant Professors

LT. COL. LELAND C. ENDSLEY — B.A., University of New Mexico; M.S., Ohio State University

MAJ. JACK L. WILSON — A.B., M.A., University of North Carolina

CAPT. ROBERT O. CLARK — B.A., University of California at Los Angeles; M.A., University of Chicago

LT. DONALD G. JANELLE — B.A., University of Southwestern Louisiana; M.A., Ph.D., Michigan State University

### Instructors

CAPT. DELMAR E. ANDERSON — B.S., Kansas State University; M.A., Northwestern University

CAPT. DAVID B. COLE — B.A., University of Texas; M.A., Syracuse University

CAPT. THOMAS K. HINCKLEY — B.A., Brigham Young University; M.A., University of Pittsburgh

LT. ALAN E. YABUI — B.S., Kansas State University; M.A., San Diego State College

### GEOGRAPHY

*Geog 120. Introduction to Geography* 1 (L120)

Principles of physical and cultural geography followed by their application to social, economic, and political patterns. Evaluations of regional associations evolving from the synthesis of man's natural and cultural environment. *Final exam. 2½ sem hrs, fall or spring.*

*Geog 282. Physical Geology* 1 (L282)

Origin and development of minerals, rocks, and earth structures. Emphasizes the geomorphic processes and the evolution and classification of landforms. Local field trips with Rocky Mountain region used as demonstration model. *Final exam. Prereq: Geog 120. 3 sem hrs, spring.*

*Geog 350. Systematic Cultural Geography* 1 (L350)

A geographic analysis of selected cultural problems such as those associated with urban settlement, demographic change, agricultural revolution, and industrial growth. Considers stages of political, economic and social development and human adaptation to the natural environment. *Final exam. Prereq: Geog. 120. 2½ sem hrs, fall or spring.*

*Geog 372. Economic Geography* 1 (L372)

Location and organization of world's major resources and associated production, distribution, and consumption patterns. Special attention to contemporary industrial and commercial development. Selected case studies on regional development. Field trips required. *Final exam. Prereq: Geog 120. 2½ sem hrs, fall.*

*Geog 381. Geodesy* 1 (L381)

Geodetic parameters, theory, and techniques. Emphasizes fundamentals for precise location of points on earth's surface. Application of space photography to cartography and geography. Field work including operational geodetic satellite observations for the NASA Geodetic Satellite program, local gravity measurements, and astronomic determination of latitude, longitude and azimuth. Field trip to ACIC, St. Louis, Mo. *Final exam. Prereq: Geog 120 and Math 162, 202, 231 or equivalent. 3 sem hrs, spring.*

*Geog 451. Advanced Geographic Techniques* 2 (L451)

Examines geographic methodology within certain sub-fields such as physical, historical, political, and quantitative geography, location theory, and geographic thought. In seminar, faculty specialists focus on the use of geographic methodology as an analytical and research tool. *Field trips required. Final exam. Prereq: Geog 350. 5 sem hrs, fall.*



*Geog 471. Western Europe and the Mediterranean* 1 (L471)  
Geographical analysis of the physical, cultural, economic, and political aspects of the countries of Western Europe. Special attention to regional distribution of resources, agricultural production, industrial power, and international trade. The role and effects of such regional economic or political groupings as the Common Market. *Final exam. Prereq: Geog 120. 2½ sem hrs, fall.*

*Geog 472. USSR and Eastern Europe* 1 (L472)  
Geographic base of the Soviet Union and countries of Eastern Europe. Investigates each nation's physical and cultural environment with respect to settlement, agricultural and industrial resources, economic structure, and urbanization. Emphasizes geographical aspects of contemporary agricultural and industrial developments. *Final exam. Prereq: Geog 120. 3 sem hrs, spring.*

*Geog 473. The Far East* 1 (L473)  
Physical, economic, and cultural aspects of the Far East with emphasis on Southeast Asia's and China's geographic bases, as well as their historical evolution as geographic regions. Utilizing underdeveloped Far Eastern countries as models, nation building and counterinsurgency within newly emerging areas and the resultant changing geographies are examined. *Final exam. Prereq: Geog 120. 2½ sem hrs, fall.*

*Geog 474. Latin America* 1 (L474)  
Geographic analysis of the physical, cultural, economic, and political interrelations of the nations of Latin America. Considers the regional distribution of resources, agricultural production, industrial strength, and settlement patterns. Emphasizes the diversity of developmental problems. *Final exam. Prereq: Geog 120. 2½ sem hrs, fall.*

*Geog 499. Independent Study* 2-5 (L499)  
Independent research and study in a specific area of geography conducted on a tutorial basis. *Term paper. Prereq: 1/C standing and department permission. 2 to 5 sem hrs, fall or spring.*

*Current Course Number*  
Geog 120

*Previous Course Number*  
Geog 110





## Department of Law

### **Permanent Professor and Head of the Department**

COL. MARCOS E. KINEVAN — B.S., United States Military Academy; J.D., University of California at Berkeley

### **Associate Professors**

LT. COL. JAMES D. MAZZA — A.B., LL.B., West Virginia University

LT. COL. CLYDE M. THOMAS — LL.B., University of Georgia; M.B.A., George Washington University

LT. COL. ALLAN ZBAR — B.A., J.D., University of Florida

MAJ. RICHARD R. LEE — B.S., J.D., University of North Carolina

### **Assistant Professors**

MAJ. THOMAS F. BURKE — B.A., Omaha University; LL.B., Creighton University

MAJ. BERNARD A. WAXSTEIN, Jr. — B.S., LL.B., Fordham University; M.S., George Washington University

CAPT. ALAN I. HERMAN — B.S., New York University; LL.B., Syracuse University College of Law; LL.M., Yale Law School

### **Instructors**

MAJ. WILLIAM H. CARNAHAN — LL.B., Notre Dame University

MAJ. SAMUEL P. MORROW, Jr. — B.S., Lane College; LL.B., Boston University

MAJ. PETER D. NEWHOUSE — LL.B., Ohio State University

MAJ. GORDON E. SCHIEMAN — B.S., University of Illinois; LL.B., University of Denver

CAPT. GENE H. ANDERSON — A.B., LL.B., University of Kansas

CAPT. HAROLD M. HECHT — B.A., Brooklyn College; LL.B., Brooklyn Law School

CAPT. ROBERT H. PERKINS — A.B., LL.B., University of Alabama

## **LAW**

*Law 200. An Introduction to Law* 1 (N200)

Principles of elementary law including contracts, agency, negotiable instruments, property, torts, persons, and administrative law. *Prereq:* 3/C standing. *Final exam.* 2½ sem hrs, fall or spring.

*Law 304. Criminal Law and Evidence* 0 (N304)

Principles of criminal law, criminal evidence, and criminal jurisdiction under international law, with emphasis on military law. *Prereq:* Law 200 and 2/C standing. *Final exam.* 1 sem hr, winter.

*Law 402. Personal Estate Planning* 0 (N402)

Basic principles of personal finances, insurance, investments, government benefits, wills and trusts. *Prereq:* Law 200 and 1/C standing. *Final exam.* ½ sem hr, winter.

*Law 451. American Constitutional Law* 1 (N451)

The background and case progress of American constitutional doctrine emphasizing the division of powers, guarantees of personal freedoms, influence of the Supreme Court in the development of our constitutional system, and future role of Court. *Prereq:* Law 200 and Pol Sci 211. *Final exam.* 3 sem hrs, spring.

*Law 461. International Law* 1 (N461)

A foundation in public international law (among nations) including its history and development, sources and applications to current events. Subjects

considered are international agreements, legal status of international organizations, rights and duties of nations, jurisdiction, nationality, sovereign territory, law of the sea, law of war, air and space law and settlement of international disputes. *Prereq: Law 200. No final exam. 2½ sem hrs, fall.*

#### **Law 462. Government Contract Law**

1 (N462)

Comprehensive study of government contract law with emphasis given to basic legal principles, procurement policy, methods of procurement, types of contracts, contract clauses, taxation, modification, disputes and termination. *Prereq: Law 200. No final exam. 3 sem hrs, spring.*

#### **Current Course Numbers**

Law 200  
Law 304 and 402

#### **Previous Course Numbers**

Law 311  
Law 312

## **Department of Political Science**

### **Tenure Professor and Head of the Department**

LT. COL. RICHARD F. ROSSER — B.A., Ohio Wesleyan University; M.P.A., Ph.D., Syracuse University

### **Tenure Associate Professor**

MAJ. CLAUDE J. JOHNS, JR. — B.S., M.S., Florida State University; Ph.D., University of North Carolina

### **Associate Professors**

LT. COL. WILLIAM R. NELSON — J.D., University of Utah; LL.M., New York University; M.A., Miami University; Ph.D., University of Colorado

MAJ. B. CONN ANDERSON, JR. — B.S., United States Military Academy; M.A., Oxford University

MAJ. LEE A. DENSON, JR. — B.S., United States Military Academy; M.P.A., Ph.D., Harvard University

MAJ. JOHN T. POIRIER — B.S., United States Military Academy; M.P.A., Harvard University

MAJ. MARK E. SMITH III — B.S., United States Military Academy; M.A., University of Chicago

SQ. LDR. DERRIK B. ADAMS (RAF) — B.A., University of Exeter, England; B.S., University of London; M.A., University of Denver

### **Assistant Professors**

MAJ. WILLIAM E. ALBRIGHT, JR. — B.S., United States Military Academy; M.A., Graduate Institute of International Studies, Geneva, Switzerland

LT. CMDR. JOHN A. BUTTERFIELD (USN) — B.S., United States Naval Academy; M.P.A., Harvard University

MAJ. RALPH N. HOFFMAN, JR. — A.B., Stanford University; M.A., University of Arizona

MAJ. HARPER B. KEELER — B.S., United States Military Academy; Ph.D., Massachusetts Institute of Technology

MAJ. PERRY M. SMITH — B.S., United States Military Academy; Ph.D., Columbia University

MAJ. ALAN R. THOENY — B.S., United States Naval Academy; M.S., University of Wisconsin

MAJ. PETER F. WITTERIED (USA) — B.S., United States Military Academy; M.A., University of Virginia

CAPT. JAMES W. CHAPMAN, II — B.S., United States Military Academy; A.M., Ph.D., Princeton University

CAPT. CURTIS G. COOK — B.S., United States Air Force Academy; M.A., Johns Hopkins University

CAPT. DICK J. PETERSEN — B.A., University of Iowa; M.A., University of Colorado

LT. GEORGE C. DAUGHAN — B.A., University of New Hampshire; M.A., Harvard University

### Instructors

- MAJ. EDWARD E. BOZIK — B.S., California State College
- MAJ. ROBERT R. FULLER, JR. — B.A., University of Oklahoma; M.A., Eastern New Mexico University
- MAJ. DAVID M. GOODRICH — B.S., United States Air Force Academy; M.A., University of California at Los Angeles
- MAJ. FRANKLIN D. MARGIOTTA — B.S., M.A., Georgetown University
- MAJ. RAY G. THOMPSON — B.A., Tulane University; M.A., Syracuse University
- CAPT. RICHARD H. BUCHER — B.A., University of Minnesota; A.M., Duke University
- CAPT. BENJAMIN C. GLIDDEN — B.S., United States Military Academy; M.P.A., Harvard University
- CAPT. GEORGE KOLT — B.A., Rutgers University; M.A., University of Washington
- CAPT. OWEN W. LENTZ — B.S., United States Air Force Academy; M.A., Georgetown University
- CAPT. CHARLES A. MAY, JR. — B.S., United States Air Force Academy; M.A., Columbia University
- CAPT. ROY W. STAFFORD, JR. — B.S., United States Air Force Academy; S.M., Massachusetts Institute of Technology
- CAPT. EDWARD L. WARNER III — B.S., United States Naval Academy; M.A., Princeton University
- LT. PAUL J. CASSIDY — B.A., University of Massachusetts
- LT. HARRY G. FORBES, JR. — B.S., University of Tennessee; M.A., University of Florida
- LT. C. REED GUTHRIDGE — B.A., Princeton University; LL.B., Yale University

### Visiting Lecturer

- FSO-4 ELLIS O. JONES III — B.A., M.A., Yale University

### POLITICAL SCIENCE

#### *Pol Sci 211. The American Political System* 1 (U211)

First of two-course sequence introducing central concepts of political science. An investigation of national political systems and contrasting democracy with totalitarianism. Emphasis on analysis of the American constitutional system in the context of domestic politics concluding with a discussion of relevant political, economic, and national security issues. *Final exam. Pol Sci 211 and 212 must be taken in consecutive semesters. 2½ sem hrs, fall or 3, spring.*

#### *Pol Sci 212. The International Political System* 1 (U212)

A study of American foreign policy precedes an investigation of the international political system. Emphasis on the nation-state in international politics: the instruments of national policy, controls in interstate relations, and patterns of conflict and cooperation. Survey of contemporary strategic policies and a political-military case study. *Final exam. Prereq: Pol Sci 211 in preceding semester. 2½ sem hrs, fall or 3, spring.*

#### *Pol Sci 232. Contemporary Foreign Governments* 1 (U232)

A comparative study of selected political systems. Emphasis on the structure of government and the political process. *Final exam. Prereq: Pol Sci 211. 3 sem hrs, spring.*

#### *Pol Sci 352. Modern Political Theory* 1 (U352)

Political thought from Machiavelli to the present. The relationship between basic theoretical assumptions and concepts such as community, justice, freedom, order, law, and rule. *Final exam. Prereq: Pol Sci 211. 3 sem hrs, spring.*

#### *Pol Sci 371. Political Parties and the Democratic Process* 1 (U371)

Roles and activities of political parties and interest groups in the American governmental process. *Final report. Prereq: Pol Sci 211. 2½ sem hrs, fall.*

- Pol Sci 381. Classical Political Theory* 1 (U381)  
Political thought from Greek antiquity to the 16th century. The relationship between basic theoretical assumptions and concepts such as community, justice, freedom, order, law, and rule. *Final exam. Prereq: Pol Sci 211. 2½ sem hrs, fall.*
- Pol Sci 383. The American Foreign Policy Process* 1 (U383)  
The environment within which foreign policy is made. Particular attention given to roles of the Department of State, the President, the Congress, and various executive departments. Case studies. *Final exam. Prereq: Pol Sci 211. 2½ sem hrs, fall.*
- Pol Sci 385. Public Administration* 1 (U385)  
Theory and practice of public administration in the American political system. The relationship of theoretical roots to the environment, characteristics, and accountability of administrative behavior. *Final exam. Prereq: Pol Sci 211. 2½ sem hrs, fall.*
- Pol Sci 411. International Relations* 1 (U411)  
Contemporary patterns of conflict and cooperation among the nation-states of the world. Characteristics of the nation-state system, instruments of national policy, controls of interstate relations, and participation of the United States in world affairs. *Final exam. Prereq: Pol Sci 211. Class of 1970 and subsequent classes take Pol Sci 212 in place of Pol Sci 411, offered last time in fall of 1968. 2½ sem hrs, fall.*
- Pol Sci 412. Defense Policy* 1 (U412)  
Relationships among military policy, foreign policy, and national security policy. Formulation of defense policy in terms of external threats, American political climate, and impact of military technology. Institutional machinery for making strategy. *Final exam. Prereq: Pol Sci 212 or 411. 3 sem hrs, spring.*
- Pol Sci 456. International Organization and Military Security Systems* 1 (U456)  
International organization focusing upon the United Nations' role in international politics, and an analysis of regional security systems. *Final report. Prereq: Pol Sci 212 or 411. 2½ sem hrs, spring.*
- Pol Sci 472. The Communist System* 1 (U472)  
Dynamics of world communism with emphasis on the political process in the Soviet Union and its role in international politics, and the relationship between communist ideology and power. *Final exam. Prereq: Pol Sci 211. 3 sem hrs, spring.*
- Pol Sci 473. Politics of the Far East* 1 (U473)  
Survey of political institutions, developmental prospects, and foreign policies of various governments, with an examination of general strategic issues. Focuses on China, its political structure and influence in Asia, and treats other Asian nations as they relate to China and present significant governmental and developmental problems. *Final exam. Prereq: Pol Sci 211. 2½ sem hrs, fall.*
- Pol Sci 474. Politics of the European Community* 1 (U474)  
Political developments in Western Europe from the Marshall Plan to the present. Potentialities of a united Europe as a third force, and consideration of both institutional arrangements and political strategies of the Western European nations. *Final report. Prereq: Pol Sci 211. 2½ sem hrs, fall.*
- Pol Sci 475. Problems of the Developing Areas* 1 (U475)  
Analysis of the developing areas. Cultural background, colonialism, nationalism, and other ideologies; changes in social structure and economic require-



ments; population problems; Cold War pressures and guerrilla movements. *Final report. Prereq: Pol Sci 211. 2½ sem hrs, fall.*

*Pol Sci 476. Politics of Latin America* 1 (U476)  
Comparative study of selected Latin American political systems. Fundamental factors affecting political stability in Latin America; the interrelationship of economic, military, political, and social factors in the growth of Latin American political systems; and the interhemisphere relations. *Final report. Prereq: Pol Sci 211. 3 sem hrs, spring.*

*Pol Sci 484. The Formulation of Military Strategy* 1 (U484)  
Advanced version of Pol Sci 412, designed for cadets majoring in International Affairs or interested in advanced achievement in Defense Policy. Formulation of military strategy with emphasis on the policy-making machinery and process, roles of experts and interest groups in defense decision-making, the planning function, and alternative national strategies. Analysis is facilitated by a Strategy and Force Evaluation Game. *Final report. Prereq: Offered in place of Pol Sci 412 to cadets who have completed Pol Sci 212 or 411 and have a cumulative GPA of 3.0, or department approval. 3 sem hrs, spring.*

*Pol Sci 486. Methods of Strategic Analysis* 1 (U486)  
Approaches, techniques, and concepts employed in the formulation of defense policy and the evaluation of strategies. Includes an evaluation of analytical tools utilized in the design of strategic forces, analogies of game theory to arms control and deterrent military policies, and models of international conflict. Application of systems analysis. *Final report. Prereq: Pol Sci 412 or 484. 3 sem hrs, spring.*

*Pol Sci 488. Science, Technology, and Government* 1 (U488)  
Political environment of governmental scientific activities and the impact of science on the American political system. The scientist in policy making, governmental organizations for research and development, and the nature of the scientific enterprise. *Final report. Prereq: Pol Sci 211. 3 sem hrs, spring.*

*Pol Sci 491. Problems in International Affairs* 2 (U491)  
Examination of the international political process with emphasis on advanced analytical techniques. The Statecraft Game and individual case studies utilizing the interdisciplinary background gained from introductory courses in international affairs. *Final report. Prereq: Pol Sci 212. 5 sem hrs, fall.*

*Pol Sci 499. Independent Study* 1-2 (U499)  
Individual study or research in a carefully selected topic conducted on a tutorial basis. *Research paper or directed reading. Prereq: Department approval. 2 to 5 sem hrs, fall or spring.*

*Pol Sci 561. Contemporary Political Theory* 1 (U561)  
Development and content of scientific political theory and methodology. Problems contemporary theorists set for themselves, the intellectual tools they employ, and the conclusions they reach. *Final exam. Prereq: Pol Sci 352. 2½ sem hrs, fall.*

*Pol Sci 565. International Politics: Problems in the Maintenance of Security* 1 (U565)  
Major sources of international conflict. Interdisciplinary approach to the complex nature of conflict in the world, contrasting the works of authorities in many fields with the traditional explanations of international relations specialists. *Final report. Prereq: Pol Sci 212. 3 sem hrs, fall.*

*Pol Sci 566. International Politics: Theories and Concepts* 1 (U566)  
Rigorous examination of international relations theories with emphasis on

current approaches, methodology, and constructs. *Final report. Prereq: Pol Sci. 212. 4 sem hrs, spring.*

*Pol Sci 572. Soviet Foreign Policy*

1 (U572)

Examination of Soviet foreign policy with emphasis on the period since 1945. Role of ideology, national interest, and domestic politics. Comparison of Soviet and American foreign policy in respect to process and goals. *Final exam. Prereq: Pol Sci 212. 3 sem hrs, spring.*

*Current Course Number*  
Pol Sci 211

*Previous Course Number*  
Pol Sci 201

## **Department of Psychology and Leadership**

### **Professor and Head of the Department**

COL. HENRY E. WOJDYLA — B.A., Sacramento State College; M.A., Baylor University

### **Tenure Associate Professors**

LT. COL. OGDEN BROWN, JR. — A.B., M.A., American University; Ph.D., Purdue University

LT. COL. JACK E. SEXSON — B.A., Colorado State College; M.Ed., Trinity University; Ed.D., Colorado State College

LT. COL. ROBERT E. STOCKHOUSE — B.S., Black Hills State College; M.A., Columbia University; Ed.D., Stanford University

### **Associate Professors**

LT. COL. CHARLES R. HOLLOMAN — B.A., Colorado State College; M.S., University of Colorado; D.B.A., University of Washington

LT. COL. GEORGE W. MUHLBACH — B.A., University of Omaha; M.A., Colorado State College

LT. COL. ROBERT RAFUL — B.S., University of California at Berkeley; M.B.A., Syracuse University

MAJ. DENNIS E. COURTANEY — B.S., M.S., Ph.D., Purdue University

MAJ. PHILLIP R. FERDINAND — B.A., University of Akron; M.S., Purdue University

MAJ. MICHAEL J. GRADY, JR. — Ed.B., Rhode Island College; M.A., Ph.D., University of Alabama

MAJ. HAL W. HENDRICK — B.A., Ohio Wesleyan University; M.S., Ph.D., Purdue University

MAJ. DONALD B. HOOPER — B.S., M.B.A., Ohio State University

CAPT. JOHN S. GILLIS — B.A., Stanford University; M.S., Cornell University; Ph.D., University of Colorado

### **Assistant Professors**

LT. COL. VICTOR F. PHILLIPS, JR. — B.S., American University; M.S., University of Connecticut; D.B.A., Indiana University

MAJ. HAROLD S. COYLE, JR. — B.S., United States Naval Academy; M.S.I.M., Ph.D., Purdue University

MAJ. GILBERT R. KAATS — B.A., University of Maryland; M.A., George Washington University

MAJ. CHARLES R. KENNEDY — B.B.A., University of Texas; M.B.A., University of Cincinnati

MAJ. JOHN R. KLUTTZ — B.S., East Carolina College; M.A., Northern Michigan University; E.D.S., Ball State University

MAJ. EUGENE OWENS — B.A., University of Arizona; M.S., George Washington University; M.S., Purdue University

MAJ. ROBERT B. TEBBS — B.A., University of Colorado; M.A., University of Wyoming

CAPT. RABEL J. BURDGE — B.S., M.S., Ohio State University; Ph.D., Pennsylvania State University

CAPT. JEFFERSON M. KOONCE — B.S., M.S., Tulane University

LT. EDWARD A. THOMPSON — B.A., Denison University; M.A., Ph.D., University of Delaware

### Instructors

MAJ. THEODORE B. ALDRICH — B.A., University of Connecticut; M.S., Purdue University

MAJ. PHILIP J. DE LEO — B.A., Fordham University; M.S., Purdue University

MAJ. JOHN O'CONNOR — B.A., Syracuse University; M.A., George Peabody College

CAPT. H. L. LEFFERTS, JR. — A.B., Colgate University; M.A., University of Illinois

LT. THOMAS P. O'HEARN, JR. — B.S., Fordham University; M.Ed., Springfield College

### PSYCHOLOGY

#### *Psych 100. General Psychology* 1 (D100P)

Presents those determinants of behavior which contribute to physical, psychological, and social maturity. Applies psychological principles from the areas of learning, perception, motivation, personality, mental health, and group processes to understanding human behavior, achieving personal adjustment, and developing Air Force leadership. *Final exam. 2½ sem hrs, fall or spring.*

#### *Psych 302. Human Relations and Leadership* 1 (D302P)

Basic functions of management in the military environment with particular emphasis on the role of the leader. Through the use of case studies, direct application is made to the areas of leadership, human relations, line-staff relationships, communications, organizational behavior, and morale and discipline. *Final exam. Prereq: Psych 100 and 3/C standing. 2½ sem hrs, fall or spring.*

#### *Psych 330. Psychology of Learning* 1 (D330P)

Investigation of the learning process to include basic principles of learning and critical examination of learning theories. Emphasis on empirical evaluation of research on learning principles, and current applications of research and theories. *Final exam. Prereq: Psych 100. 2½ sem hrs, fall or spring.*

#### *Psych 343. Motivation and Leadership* 1 (D343P)

Examines basic processes and individual differences in the motivation of behavior. Major theoretical orientations and concomitant research to include neuropsychological, homeostatic, cognitive, psychoanalytic, force-for-growth, and social motive models, with special application for effective interpersonal behavior and the analysis of military leadership. *Final exam. Prereq: Psych 100. 2½ sem hrs, fall or spring.*

#### *Psych 352. Social Psychology* 1 (D352P)

Investigates interactional forces between groups and the individual in society. Examines effects of diverse social and psychological pressures such as public opinion and propaganda on the individual and the group. *Final exam. Prereq: Psych 100. 2½ sem hrs, fall or 3, spring.*

#### *Psych 370. Tests and Measurements* 1 (D370P)

Introduction to the general area of educational and psychological measurement. Theory, content, and uses of measuring devices in the determination and analysis of individual differences. Emphasis on performance, ability, and achievement tests and interpretation of test results. *Final exam. Prereq: Psych 100 and Math 232. 2½ sem hrs, fall or 3, spring.*

#### *Psych 372. Experimental Psychology* 1 (D372P)

Experimental design and psychological research methods with special application to Air Force problems of human behavior. Considers major experimental methods and principles used in solution and analysis of problems related to psychological research. Lab. *Individual research project. Prereq: Psych 100 and Math 232. 2½ sem hrs, fall or 3, spring.*

#### *Psych 377. Engineering Psychology* 1 (D377P)

Survey of human factors in engineering with particular reference to human functions in man-machine systems. Consideration of human abilities and

limitations in relation to design and development of subsystems, equipment, and work environments in aerospace systems. *Final exam. Prereq: Psych 100 and Life Sci 210. 2½ sem hrs, fall or spring.*

**Psych 430. Industrial Psychology** 1 (D430P)  
Investigation of variables affecting job performance in military and industrial environments. Emphasizes personnel measurement, selection and appraisal, social considerations in a working environment, systems development, and research methodology in analysis of industrial behavior. *Final exam. Prereq: Psych 100. 2½ sem hrs, fall or spring.*

**Psych 434. Organizational Psychology** 1 (D434P)  
Investigates characteristics of the organization and how they impinge upon the individual within it. Explores implications for management of individual and small group processes and their interaction with structural factors in organizations. Emphasis on organizational structure, communication and conflict, interpersonal relations, and rational aspects of organizational decision processes as related to Air Force leadership. *Term paper. Prereq: Psych 100 and 302. 2½ sem hrs, fall or spring.*

**Psych 462. Personality** 1 (D462P)  
Analysis of the principal aspects of personality, its determinants, and major theoretical problems. Effective-ineffective adjustment from normal to abnormal with implications for the officer and commander in fulfilling the requirements of AFM 160-55 and AFR 35-9 on human reliability. *Final exam. Prereq: Psych 100. 2½ sem hrs, fall or 3, spring.*

**Psych 464. Command Leadership Problems** 1 (D464P)  
Principles and theories derived from the social sciences as applied to contemporary problems in the Air Force. Analysis of comprehensive case studies for realistic practice in solving leadership problems, particularly at the squadron and wing levels. *Term paper. Prereq: Psych 100 and 302; 2/C standing. 2½ sem hrs, fall or 3, spring.*

**Psych 490. Senior Seminar in Psychology** 2 (D490P)  
Development and historical basis of psychological thought from the early Greeks to the present. Major problems, trends, and various systematic approaches to the study of human behavior. Emphasis on development and role of theory and procedures in relation to other social and natural sciences. *Final exam. Prereq: Psych 330, 343, 352, 372 and 462. 5 sem hrs, fall or spring.*

**Psych 499. Independent Research** 1-2 (D499P)  
Individual study in the disciplines of psychology, sociology, or anthropology. Conducted on a tutorial or seminar basis. *2 to 5 sem hrs, fall or spring.*

#### Current Course Numbers

Psych 100  
Psych 434

#### Previous Course Numbers

Psych 203  
Psych 432

## SOCIOLOGY

**Soc 304. Sociology of Family Relations** 0 (D304S)  
The transition from single to married life with emphasis on the Air Force environment. Investigates cultural factors, choosing a compatible mate, and inter-family dynamics which inhibit or contribute to healthy family and marital relations. *Final exam. Prereq: Psych 100 and 3/C standing. ½ sem hr, winter.*

**Soc 360. Sociology** 1 (D360S)  
Scientific study of the influence of group life on human behavior. Includes human relations in terms of culture, norms, primary groups, stratification,



collective behavior, population, family, city, minorities, political and military sociology, and criminal and delinquent behavior. *Final exam. 2½ sem hrs, fall or spring.*

*Soc 463. Sociology of Industrial Relations*

1 (D463S)

Development of labor organizations, policies and practices of American management, and introduction to collective bargaining. Labor-management relations as personal and group adjustment of governmental and societal pressures. Role of the military manager in industrial relations and employee-management relations in the Federal Service. *Final exam. 2½ sem hrs, fall or spring.*

*Soc 544. Seminar in Organization Theory*

1 (D544S)

Development of an analytical framework for research on the structure, function, and variables affecting complex organizations. Administrative processes studied from the points of view of the individual, organization, and environment. *Term paper. Prereq: Completion of four or more Psychology courses. 3 sem hrs, fall or spring.*

*Soc 546. Seminar Industrial Relations*

1 (D546S)

Current and persistent issues in industrial relations including collective bargaining processes and national labor policy. Department of Defense problems emphasized. Independent library reading stressed and a research paper required. *Term paper. Prereq: Soc 463. 3 sem hrs, fall or spring.*

*Current Course Number*  
Soc 304

*Previous Course Number*  
Psych 304

## **ANTHROPOLOGY**

*Anthro 351. Cultural Anthropology*

1 (D351A)

The study of man as culture determines his behavior. Using theories of the nature of culture and cultural processes, contemporary cultures are analyzed focusing on problems inherent in their interrelations. *Final exam. 2½ sem hrs, fall or spring.*

*Anthro 451. Ethnology*

1 (D451A)

Utilizes the holistic nature of culture and laws of cultural dynamics to provide a coherent theoretical framework for the analysis and description of particular cultures. *Individual problem-oriented research paper. Prereq: Area Studies Major or permission of instructor. 2½ sem hrs, fall or spring.*





## ACADEMIC MAJORS

### DIVISION OF BASIC SCIENCES

#### Basic Sciences

The Major in Basic Sciences is intended for the student whose ability and interests lean to the basic sciences but who does not want to specialize to the extent required for a major in chemistry, life sciences, mathematics, or physics. This major allows the student considerable latitude in selecting his own area of emphasis and degree of specialization. All of the basic sciences are represented in the required courses and sufficient option spaces exist to allow the cadet to pursue his own particular interests in some depth.

In addition to the core curriculum, the following courses are required for the major:

Math 232	Probability and Statistics
Math 260	Applied Math I
Phys 333-334	Intermediate Physics I and II
Mech 361	Vector Engineering Mechanics



A two-course sequence in organic, physical or analytical chemistry, one course in materials science, five additional courses selected from the offerings of the Divisions of Basic and Engineering Sciences, and two additional courses from any department, all selected with approval of the faculty advisor.

Cadets electing this major should choose French, German or Russian as their language.

#### **ATMOSPHERIC SCIENCES MINOR**

The Minor in Atmospheric Sciences is for the student interested in meteorology. In addition to forming an excellent basis for further training as a career weather officer, the courses in atmospheric science provide a background especially valuable to any flying officer. By filling five science electives with the courses listed below, cadets can earn a Minor in Atmospheric Sciences in conjunction with a Basic Sciences Major.

Atm Sci 250	Introduction to Atmospheric Science
Atm Sci 351	Physical Processes in the Atmosphere
Atm Sci 444	Dynamics of the Atmosphere
Atm Sci 450	Thermodynamics and Statics of the Atmosphere
Physics 370	Introductory Space Science

#### **Chemistry**

The Major in Chemistry is recommended for students who are interested in chemical research or applications. The major is designed to prepare cadets for a junior officer position in research or development or for graduate training. It emphasizes the use of laboratory methods not only for reinforcement of lecture material but also for individual research projects. Two courses are required beyond the minimum graduation requirements. Successful completion of the requirements for this major results in the degree of Bachelor of Science in Chemistry.

In addition to the core curriculum, the following courses are required for the major:

Chem 233-234	Organic Chemistry I and II
Chem 243-244	Organic Chemistry Lab I and II
Chem 333	Instrumental Analysis
Chem 335-336	Physical Chemistry I and II
Chem 344	Physical Chemistry Lab
Chem 443	Advanced Physical Chemistry Lab
Chem 461	Bonding and Molecular Structure
Math 260	Applied Math I
Phys 363-364	Intermediate Physics I and II

Two additional chemistry courses and one course from any department with approval of the faculty advisor.

This major fulfills the recommendations of the Committee on Professional Training of the American Chemical Society. The language

election must be German or Russian. Cadets who do not take Chem 101-102 or 121-122 must take Chem 222, Analytical Chemistry. Assignment to the various core chemistry sequences is determined by achievement in a validation examination given to all entering cadets.

## **Life Sciences**

The Major in Life Sciences is for the student whose abilities and interests lean toward the life sciences and their application to the aerospace mission of the Air Force. It prepares the cadet for a junior officer position in research or development or for graduate training. It emphasizes the use of laboratory methods not only for reinforcement of lecture material but also for individual research projects. This major is a suggested preparatory sequence for advanced study in medicine or the biological sciences.

In addition to the core curriculum, the following courses are required for the major:

Life Sci 260	Modern Biological Concepts
Life Sci 263	Introduction to Life Sciences
Life Sci 333	Environmental Physiology
Life Sci 363	Genetics
Life Sci 365	Radiation Biology
Life Sci 431-432	Microbiology I and II
Life Sci 452	Space Physiology
Chem 233-234	Organic Chemistry I and II
Phys 333-334	Intermediate Physics I and II

One additional life science option and two courses from any department with approval of the faculty advisor.

Life Sci 461 (Developmental Anatomy I) fills the requirement for both Life Sci 333 and the life science option. Life Sci 462 (Developmental Anatomy II) fills the requirement for both Life Sci 365 and 452. Cadets desiring a Life Sciences Major and recommendation to medical training must complete Life Sci 461 and 462, and must take Chem 243 and 244 in place of Phys 334 and one elective.

## **Mathematics**

The Major in Mathematics provides the background necessary to analyze and solve the complex technical, operational and management problems in the modern Air Force. Once the cadet has become competent in the basic techniques of algebra and calculus, he may pursue areas of his own interest. The major is designed so that a participant will be qualified to do graduate work in any of the basic, engineering, managerial, or social sciences.



The following substitutions in the core curriculum are required:

Astro 451	Astrodynamics I	replaces Astro 432
El Engr 351	Analysis of Electronic Systems I	
		replaces El Engr 333
El Engr 352	Analysis of Electronic Systems II	
		replaces El Engr 334

In addition to the core curriculum, the following courses are required for the major:

Math 232	Probability and Statistics
Math 260	Applied Mathematics I
Math 360	Linear Algebra
Math 366	Advanced Calculus I
Math 455	Advanced Engineering Mathematics
Physics 333	Intermediate Physics I
Physics 334	Intermediate Physics II
Mech 361	Vector Engineering Mechanics
Mech 362	Mechanics of Materials

Four advanced mathematics courses and two courses from any department with approval of the faculty advisor.

## Physics

The Major in Physics is recommended for those students who desire a broad education in the physical sciences with a rigorous specialization in applied and theoretical physics. The increased depth of studies in mathematics and physics provides excellent preparation for graduate training in physics and the applied sciences.

The following substitution in the core curriculum is required:

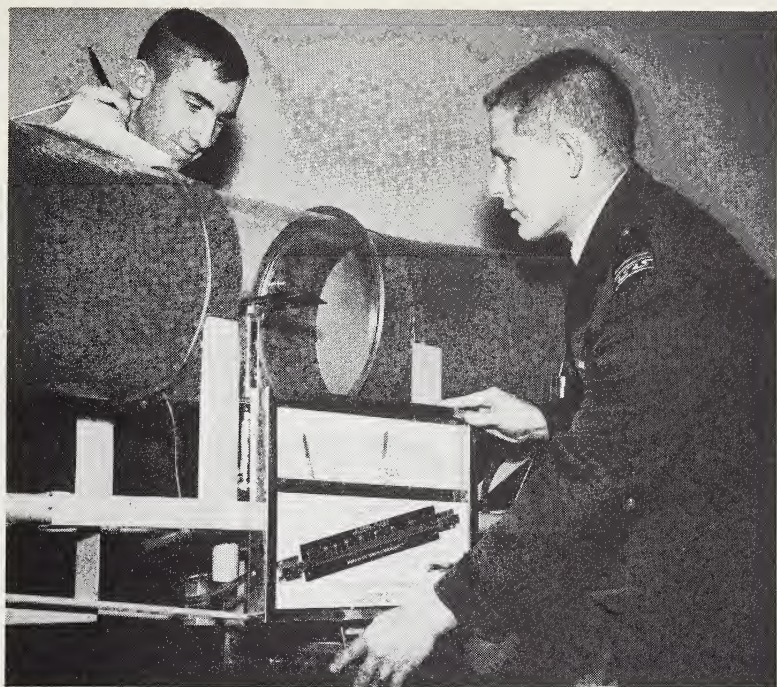
Math 161-162, Calculus, Analytic Geometry and Introduction to Differential Equations, replaces Math 101-102-201-202.

In addition to the core curriculum, the following courses are required for the major:

Phys 355	Classical Mechanics
Phys 363-364	Introduction to Modern Physics I and II
Phys 365	Statistical Physics
Phys 380	Geometrical and Physical Optics
Phys 461	Electromagnetic Theory I
Phys 473	Introduction to Quantum Mechanics
Phys 490	Advanced Physics Lab
Math 260	Applied Math I
Math 454	Vector Analysis, Fourier Series and Boundary Value Problems
Mech 361	Vector Engineering Mechanics

Two additional mathematics courses and three courses from any department with approval of the faculty advisor.

Cadets selecting this major should choose French, German or Russian as their foreign language.



## DIVISION OF ENGINEERING SCIENCES

### Aeronautical Engineering

The Major in Aeronautical Engineering is based on a broad sequence of courses in aeronautical engineering with specialization in one of three options: aerodynamics and flight mechanics, aerospace propulsion, or aerospace structures. Successful completion of this major leads to the degree of Bachelor of Science in Aeronautical Engineering. A cadet pursuing this major may compete for the Cooperative Master's Degree Program in Astronautics or Aeronautics by carrying an overload of three to five additional courses with the approval of his advisor.

The following substitutions in the core curriculum are required:

Aero 351	} Thermodynamics Fluid Dynamics I replace Aero 331 and Aero 332 Flight Dynamics Propulsion I	
Aero 361		
Aero 456		
Aero 461		
El Engr 351	Analysis of Electronic Systems I	
		replaces El Engr 333
El Engr 352	Analysis of Electronic Systems II	
		replaces El Engr 334
Astro 451	Astro dynamics I	replaces Astro 432

In addition to the core curriculum, the following courses are required for the major:

Aero 362	Fluid Dynamics II
Aero 363	Heat Transfer
Aero 472	Advanced Thermodynamics
Aero 463	Advanced Topics in Aeronautics
Aero 350	Aeronautical Laboratory
Mech 361	Vector Engineering Mechanics
Mech 362	Mechanics of Materials
Math 260	Applied Math I
Math 454	Vector Analysis, Fourier Series, and Boundary Value Problems
Phys 333	Intermediate Physics I
Phys 334	Intermediate Physics II
Mech 453	Structures

Three additional courses from any department with approval of the faculty advisor.

### Astronautics

The Major in Astronautics provides an opportunity for exceptionally capable students to extend their engineering knowledge into more difficult areas and to prepare for graduate studies in engineering. Successful completion of this major results in the award of a Bachelor of Science in Engineering Sciences and meets the requirement for the Cooperative Master's Degree Program in Astronautics.

The following substitutions in the core curriculum are required:

Aero 351	Thermodynamics	} replace Aero 331
Aero 361	Fluid Dynamics I	
Aero 461	Propulsion I	} replace Aero 332
Aero 456	Flight Mechanics	
El Engr 351	Analysis of Electronic Systems I	
		replaces El Engr 333
El Engr 352	Analysis of Electronic Systems II	
		replaces El Engr 334
Astro 451	Astrodynamics I	replaces Astro 432

In addition to the core curriculum, the following courses are required for the major:

Astro 452	Linear Control System Analysis
Astro 453	Astrodynamics II
Astro 454	Inertial Navigation and Automatic Guidance
Astro 551	Advanced Astronautics
Aero 363	Heat Transfer
El Engr 455	Fundamentals of Electronic Communications
Math 260	Applied Math I
Math 262	Applied Math II
Mech 355	Materials Science
Mech 361	Vector Engineering Mechanics
Mech 362	Mechanics of Materials
Phys 333	Intermediate Physics I

Phys 334  
Sci 350

Intermediate Physics II  
Linear Systems Analysis

An additional two-course design sequence chosen from the Engineering Departments with approval of faculty advisor. Three courses in mathematics including at least one at the 500 level, and one course in propulsion or advanced thermodynamics with approval of the faculty advisor.

## Civil Engineering

The Major in Civil Engineering prepares cadets for graduate study, for professional registration to practice civil engineering, and for duty in the Air Force civil engineering career field. Enrichment courses are offered for depth in many of the civil engineering specialties.

In addition to the core curriculum, the following courses are required for the major:

Civ Engr 340	Surveying
Civ Engr 352	Water Supply and Waste Disposal
Civ Engr 366	Fundamental Hydraulics
Civ Engr 432	Construction Engineering
Civ Engr 441	Soil Mechanics
Civ Engr 450	Properties of Materials Laboratory
Civ Engr 451	Structural Analysis
Civ Engr 454	Structural Dynamics
Civ Engr 457	Structural Steel and Reinforced Concrete Design
Civ Engr 461	Air Base Engineering
Math 260	Applied Math I
Mech 361	Vector Engineering Mechanics
Mech 362	Mechanics of Materials
Phys 430	Introduction to Modern Physics

Based upon the mathematics sequence taken, an additional one to two courses chosen from an approved list with approval of the faculty advisor.

## Computer Science

The Major in Computer Science provides a broad background in computer programming, languages, systems and applications with emphasis on electronic digital computers. The aim of this major is to provide a group of officers who are highly qualified to work in the rapidly growing areas of computer research and more general uses of computers in the Air Force.

The following substitution in the core curriculum is required:

Astro 451	Astrodynamics I	replaces Astro 432
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In addition to the core curriculum, the following courses are required for the major:

Comp Sci 381	Intermediate Digital Computer Programming
Comp Sci 482	Information Retrieval and Computer Simulation
Comp Sci 483	Programming Systems I



Comp Sci 484	Programming Systems II
Math 232	Probability and Statistics
Astro 453	Astrodynamics II
El Engr 453	Analog Computation
Econ 432	Operations Analysis
Philos 370	Introduction to Symbolic Logic
Math 341	Introductory Numerical Analysis
Math 260	Applied Math I
Mech 361	Vector Engineering Mechanics

Three additional courses related to computer applications or design with approval of the faculty advisor.

## Electrical Engineering

The Major in Electrical Engineering is designed to combine a broad education in the engineering sciences with a study in depth in the electronics, communications, and system response fields.

The following substitutions in the core curriculum are required:

El Engr 351	Analysis of Electronic Systems I	
		replaces El Engr 333
El Engr 362	Intermediate Electronics	replaces El Engr 334

In addition to the core curriculum, the following courses are required for the major:

El Engr 361	Intermediate Circuit Analysis
El Engr 363	Advanced Circuit Theory
El Engr 364	Advanced Electronics
El Engr 365	Fundamentals of Electromagnetic Fields
El Engr 366	Advanced Electrical Energy Conversion
El Engr 453	Analog Computation
El Engr 462	Communication Engineering
El Engr 477	Electromagnetic Transmission and Radiation
Astro 452	Linear Control System Analysis
Math 260	Applied Math I
Mech 361	Vector Engineering Mechanics
Mech 362	} Mechanics of Materials
or	
Mech 455	} Electronic Processes in Materials
Phys 333	
Phys 334	
	Intermediate Physics I
	Intermediate Physics II

Two additional courses from an approved list and one electrical engineering design option selected with approval of the faculty advisor.

## Engineering Mechanics

The Major in Engineering Mechanics provides a broad base of knowledge in engineering fundamentals with depth in the areas of dynamics, structural mechanics, stress analysis and materials engineering. The major gives an excellent foundation for many technical career fields and for further formal education in a variety of engineering specialties.

The following substitutions in the core curriculum are required:

El Engr 351	Analysis of Electronic Systems I	
		replaces El Engr 333
El Engr 352	Analysis of Electronic Systems II	
		replaces El Engr 334
Astro 451	Astrodynamics I	replaces Astro 432

In addition to the core curriculum, the following courses are required for the major:

Mech 350	Experimental Stress Analysis
Mech 355	Materials Science
Mech 361	Vector Engineering Mechanics
Mech 362	Mechanics of Materials
Mech 452	Advanced Structural Mechanics
Mech 464	Design
Mech 554	Advanced Dynamics
Mech 573	Continuum Mechanics
Aero 363	Heat Transfer
Math 232	Probability and Statistics
Math 260	Applied Math I
Math 454	Vector Analysis, Fourier Series, and Boundary Value Problems
Phys 333	Intermediate Physics I
Phys 334	Intermediate Physics II

Two additional courses selected from offerings of the Divisions of Basic and Engineering Sciences with approval of the faculty advisor.

## Engineering Sciences

The Major in Engineering Sciences provides a broad education in engineering as preparation for effective performance in any Air Force career field, but particularly those fields of a technical nature. It provides an excellent background for graduate study in any engineering specialty.

The following substitutions in the core curriculum are required:

Aero 351	Thermodynamics	} replace Aero 331
Aero 361	Fluid Dynamics I	
Aero 461	Propulsion I	} replace Aero 332
Aero 456	Flight Mechanics	
El Engr 351	Analysis of Electronic Systems I	
		replaces El Engr 333
El Engr 352	Analysis of Electronic Systems II	
		replaces El Engr 334
Astro 451	Astrodynamics I	replaces Astro 432

In addition to the core curriculum, the following courses are required for the major:

Aero 363	Heat Transfer
Astro 452	Linear Control System Analysis
Astro 453	Astrodynamics II
Astro 454	Inertial Navigation and Automatic Guidance
El Engr 455	Fundamentals of Electronic Communications
Math 260	Applied Math I
Math 262	Applied Math II

Mech 355	Materials Science
Mech 361	Vector Engineering Mechanics
Mech 362	Mechanics of Materials
Phys 333	Intermediate Physics I
Phys 334	Intermediate Physics II
Sci 350	Linear Systems Analysis

An additional two-course design sequence chosen from the engineering departments with approval of the faculty advisor.

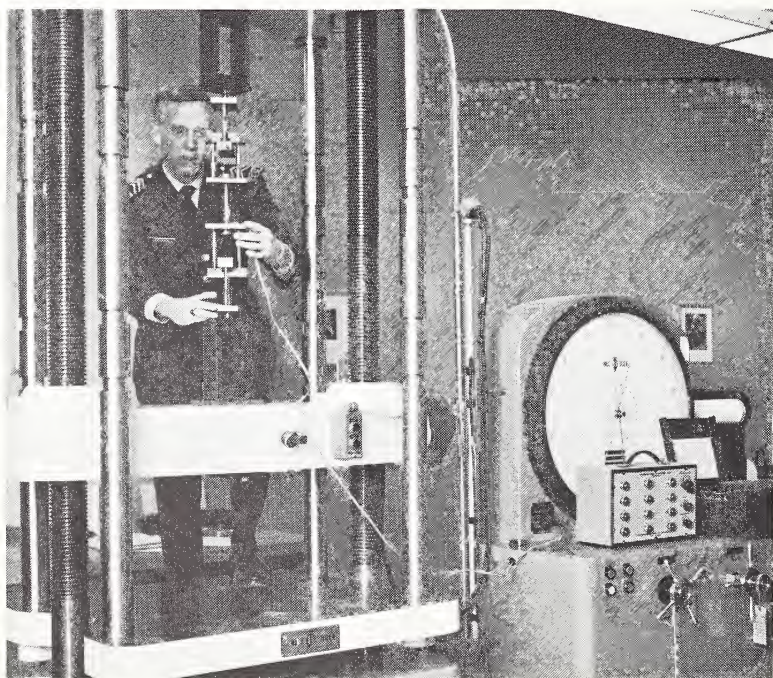
## General Engineering

The Major in General Engineering is designed for the student who desires a broad background in the field of engineering rather than a particular specialization. The major provides a means to an engineering degree through basic mathematics and permits the widest selection of options of any of the engineering majors.

In addition to the core curriculum, the following courses are required for the major:

Astro 452	Linear Control System Analysis
Civ Engr 366	Fundamental Hydraulics
Econ 439	Production Management
Law 462	Government Contract Law
Math 232	Probability and Statistics
Math 260	Applied Math I
Mech 361	Vector Engineering Mechanics
Mech 362	Mechanics of Materials

Seven additional courses from any department with approval of the faculty advisor.



## **DIVISION OF HUMANITIES**

### **American Studies**

The Major in American Studies is offered for those cadets who wish to correlate studies in the economics, politics, history, literature, and general culture of the United States into a meaningful whole.

In addition to the core curriculum, the following courses are required for the major:

Geog 350	Systematic Cultural Geography
Philos 440	Ethics
Pol Sci 412	Defense Policy
Area Stu 351	The American Identity
Area Stu 444	Seminar in American Issues
Soc 360	Sociology
Hist 492	Great Issues in American History
Fine Arts 473	The Arts in America
Pol Sci 371	Political Parties and the Democratic Process
Philos 382	American Philosophy
Law 451	American Constitutional Law
Engl 352	American Literature

Two additional courses from any department with approval of the faculty advisor.

### **General Studies**

The Major in General Studies is offered for those cadets who wish to acquire a broad knowledge in several areas of study and who desire considerable freedom to select their major's courses.

In addition to the core curriculum, the following courses are required for the major:

Geog 350	Systematic Cultural Geography
Philos 440	Ethics
Pol Sci 412	Defense Policy

Ten additional courses from any department including one double-unit course or eleven single-unit courses. Armnshp 440 or one additional single-unit course from any department.

All additional courses must be approved by the faculty advisor.

### **History**

The Major in History provides an understanding of contemporary problems by studying those forces in the past which have shaped the world of the present. The factual knowledge imparted and the perspective developed are of importance to the education of all professional Air Force officers and are of particular value for those cadets contemplating careers in operations, plans or intelligence activities. The major emphasizes the development of historical judgment, research techniques, and writing skills.



In addition to the core curriculum, the following courses are required for the major:

Hist 438	Western Institutions and Ideas
Hist 460	Military Ideas and Institutions
Hist 490	Employment of Air Power
Hist 499	Independent Study
Geog 350	Systematic Cultural Geography
Philos 440	Ethics
Pol Sci 412	Defense Policy
Pol Sci 352	Modern Political Theory
Advanced Foreign Language	

Three additional history courses and two courses from any department with the approval of the faculty advisor.

A cadet electing this major should choose a foreign language to correspond with the geographical area of his primary interest.

## Humanities

The Major in Humanities is offered for those cadets who wish to increase their knowledge in the humanistic areas of language, history, literature, philosophy, and the fine arts.

In addition to the core curriculum, the following courses are required for the major:

Geog 350	Systematic Cultural Geography
Philos 440	Ethics
Pol Sci 412	Defense Policy
Philos 350	Philosophical Analysis
Philos 400	Great Religions of the World
Hist 394	} History of England
or	
Hist 492	} Great Issues in American History
Hist 438	
Advanced Foreign Language	Western Institutions and Ideas
Engl 352	American Literature
Engl 353	Shakespeare
Engl 431	English Literature
Hum 360	Classical Readings
Fine Arts 451	Introduction to the Arts
Fine Arts 458	Music Appreciation

Armnsnp 440 or one additional course from any department with approval of the faculty advisor.

## Military Art and Science

The Major in Military Art and Science provides study in areas especially concerned with the military profession with some emphasis on the role of airpower. The academic concentration consists of the basic concepts of war, its preparations, tactics and strategy, manpower, political issues, and leadership.

In addition to the core curriculum, the following courses are required for the major:

Geog 350	Systematic Cultural Geography
Pol Sci 412	Defense Policy
Philos 440	Ethics
Hist 460	Military Ideas and Institutions
Hist 463	Unconventional Warfare
Hist 490	Employment of Air Power
Area Stu 351	The American Identity
Philos 330	Introduction to the Philosophy of Science
Pol Sci 456	International Organization and Military Security Systems
Psych 464	Command Leadership Problems
Four additional courses from any department with approval of the faculty advisor.	

## **DIVISION OF SOCIAL SCIENCES**

### **Economics**

The Major in Economics provides cadets with the capability of performing economic analysis, especially of resource allocation problems associated with national security. The major is constructed on a solid foundation of economic theory and is extended by training in quantitative analysis techniques and by study in alternative specialized fields of economics.

In addition to the core curriculum, the following courses are required for the major:

Econ 430	}	Quantitative Decision Methods
or		
Econ 465	}	Introduction to Econometrics
Econ 433		Price Theory
Econ 456		Macroeconomic Theory
Geog 350		Systematic Cultural Geography
Philos 440		Ethics
Pol Sci 412		Defense Policy
Math 232		Probability and Statistics

Six additional economics courses, one additional course from any department, and Armnshp 440 or one open option with the approval of the faculty advisor.

### **Engineering Management**

The Major in Engineering Management provides the cadet with the tools, techniques and attitudes that will assist him in making significant contributions as a junior officer. A principal objective is to accelerate the student's ability to act in a mature and meaningful fashion under conditions of responsibility. The decision-making process is the principal environment toward which most of the material is directed.

In addition to the core curriculum, the following courses are required for the major:

Geog 350	Systematic Cultural Geography
Philos 440	Ethics
Pol Sci 412	Defense Policy
Math 232	Probability and Statistics
Econ 330	Principles of Accounting
Econ 430	Quantitative Decision Methods
Psych 464	Command Leadership Problems
Law 462	Government Contract Law
Econ 473	} Managerial Accounting and Finance
or	
Econ 432	} Operations Analysis
Econ 439	
	Production Management

One additional course in economics, two additional courses in psychology or sociology, Armnshp 440 or an open option, and one additional course from any department with approval of the faculty advisor.

### Far Eastern Studies

The Major in Far Eastern Studies is an interdisciplinary program designed to provide an understanding of the nations of East and Southeast Asia.

In addition to the core curriculum, the following courses are required for the major:

Geog 350	Systematic Cultural Geography
Philos 400	Great Religions of the World
Pol Sci 412	Defense Policy
Anthro 451	Ethnology
Econ 350	} International Economics
or	
Econ 452	} Economic Problems of Developing Areas
Geog 473	
Hist 343	The Far East
Pol Sci 473	History of the Far East
Pol Sci 232	Politics of the Far East
Hum 463	Contemporary Foreign Governments
Chi 471	Far Eastern Literature
Area Stu 460	Advanced Area Chinese
	Seminar in Far Eastern Issues

Two additional courses from any department with approval of the faculty advisor.

Cadets electing this major must take Chinese as their foreign language.

### Geography

The Major in Geography provides an understanding of the complex geographic relationships in the world today. This major requires study in both regional geography and systematic analysis of geographic problems. Through consultation with his advisor a cadet may study in depth a region of the world, physical or cultural geography.

In addition to the core curriculum, the following courses are required for the major:

Geog 282	Physical Geology
Geog 350	Systematic Cultural Geography
Geog 372	Economic Geography
Geog 381	Geodesy
Geog 451	Advanced Geographic Techniques
Geog 471	Western Europe and the Mediterranean
Geog 472	USSR and Eastern Europe
Geog 473	The Far East
Geog 474	Latin America
Philos 440	Ethics
Pol Sci 412	Defense Policy

Two additional courses from any department, Armnshp 440 or an open option, with approval of the faculty advisor.

Geog 499, Independent Study, is suggested for students who are interested in specialized geographical areas.

### **International Affairs**

The Major in International Affairs is an interdisciplinary program designed to provide an understanding of the complex international political and economic relationships in the world and a knowledge of the foreign policies of the United States and other nations. A Cooperative Master's Program in International Affairs is offered. In addition to the core curriculum, the following courses are required for the major:

Pol Sci 232	Contemporary Foreign Governments
Pol Sci 352	Modern Political Theory
Pol Sci 412	Defense Policy
Pol Sci 456	International Organization and Military Security Systems
Pol Sci 475	Problems of the Developing Areas
Pol Sci 491	Problems in International Affairs
Geog 350	Systematic Cultural Geography
Philos 440	Ethics
Econ 350	International Economics
Econ 452	Economic Problems of Developing Areas
Hist 332	United States Diplomatic History
Law 461	International Law
Anthro 351	} Cultural Anthropology
or	
Soc 360	} Sociology

One additional course from any department or Armnshp 440 with approval of the faculty advisor.

### **Latin American Studies**

The Major in Latin American Studies is an interdisciplinary program designed to provide the student and future Air Force officer with an understanding of the twenty republics comprising the region



of Latin America. Principal disciplines incorporated within the major are political science, history, geography, economics, foreign language, and literature pertinent to this region.

In addition to the core curriculum, the following courses are required for the major:

Geog 350	Systematic Cultural Geography
Pol Sci 412	Defense Policy
Philos 400	Great Religions of the World
Anthro 451	Ethnology
Econ 350	} International Economics
or	
Econ 452	} Economic Problems of Developing Areas
Geog 474	
Hist 341	History of Latin America
Pol Sci 476	Politics of Latin America
Pol Sci 232	Contemporary Foreign Governments
Span 479	Advanced Area Spanish
Span 499	Independent Study
Area Stu 440	Seminar in Latin American Issues

One additional course from any department, Armnshp 440 or one open option, with approval of the faculty advisor.

Cadets electing this major must take Spanish as their foreign language.

## Psychology

The Major in Psychology provides the cadet with a facility for understanding human behavior, the capability for handling typical problems throughout his career as an Air Force officer, and the basis for his future development as a military leader.

In addition to the core curriculum, the following courses are required for the major:

Geog 350	Systematic Cultural Geography
Philos 440	Ethics
Pol Sci 412	Defense Policy
Math 232	Probability and Statistics
Psych 330	Psychology of Learning
Psych 343	Motivation and Leadership
Psych 352	Social Psychology
Psych 372	Experimental Psychology (Includes Lab)
Psych 462	Personality
Psych 490	Senior Seminar in Psychology

Three additional psychology courses and Armnshp 440 or one course offered by the Department of Psychology and Leadership, with approval of the faculty advisor.

## Political Science

The Major in Political Science provides the opportunity to explore the nature of political science as an academic and intellectual discipline. It focuses on major concepts, modern problems, field

theory and methodology, and provides a foundation in both classical and modern political philosophy.

In addition to the core curriculum, the following courses are required for the major:

Pol Sci 412	Defense Policy
Pol Sci 232	Contemporary Foreign Governments
Pol Sci 352	Modern Political Theory
Pol Sci 371	Political Parties and the Democratic Process
Pol Sci 381	Classical Political Theory
Pol Sci 491	Problems in International Affairs
Geog 350	Systematic Cultural Geography
Philos 440	Ethics

Five additional political science courses, Armnshp 440 or one open option, with approval of the faculty advisor. Law 451 may be substituted for one political science course.

### **Soviet Studies**

The Major in Soviet Studies is an interdisciplinary program designed to provide an understanding of Russia and the Soviet area. Special attention is given to the relationship of the Soviet Union to Eastern Europe.

In addition to the core curriculum, the following courses are required for the major:

Geog 350	Systematic Cultural Geography
Philos 400	Great Religions of the World
Pol Sci 412	Defense Policy
Econ 451	Economic Problems of USSR and Eastern Europe
Geog 472	USSR and Eastern Europe
Hist 346	Russian History to the Modern Era
Hist 347	Modern Russian History
Hum 461	Russian Literature
Pol Sci 472	The Communist System
Russ 477	Advanced Area Russian
Pol Sci 232	Contemporary Foreign Governments
Area Stu 430	Seminar in Soviet Issues

One additional course from any department, Armnshp 440 or one open option, with approval of the faculty advisor.

Cadets electing this major must take Russian as their foreign language.

### **Western European Studies**

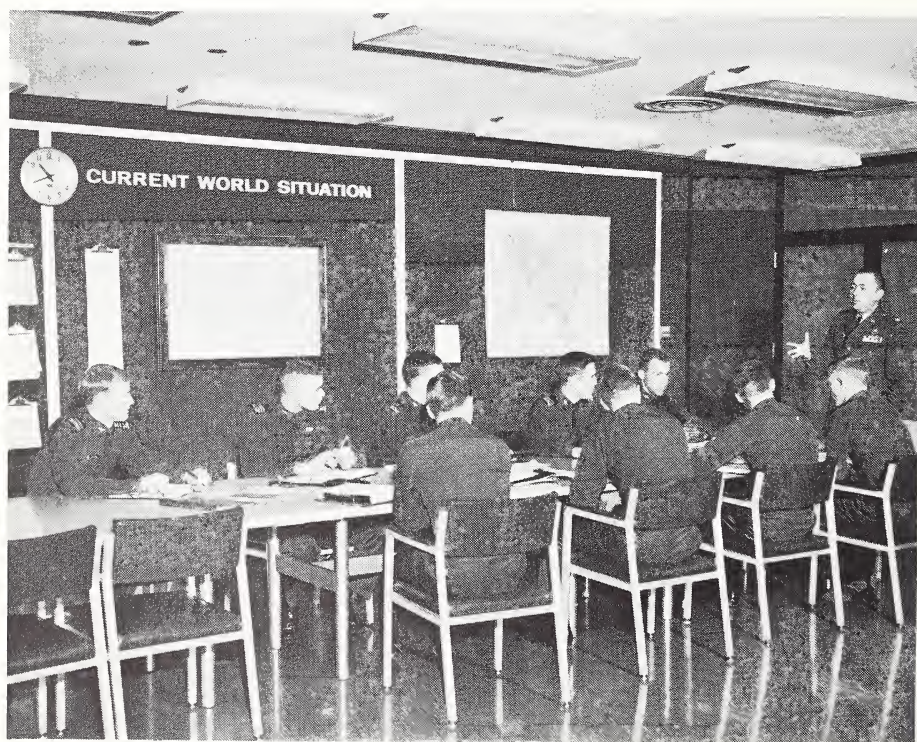
The Major in Western European Studies is an interdisciplinary program which provides a comprehensive introduction to Western Europe. Language and social science skills are stressed. The senior interdisciplinary seminar relates subject matters and skills to a common problem, serving as a capstone to the student's undergraduate preparation.

In addition to the core curriculum, the following courses are required for the major:

Geog 350	Systematic Cultural Geography
Philos 400	Great Religions of the World
Pol Sci 412	Defense Policy
Econ 350	} International Economics
or	
Hist 345	} European Diplomatic History
Econ 454	
Geog 471	European Economic Problems
Hist 438	Western Europe and the Mediterranean
Hum 442	Western Institutions and Ideas
Pol Sci 232	Modern Literature
Pol Sci 474	Contemporary Foreign Governments
Area Stu 450	Politics of the European Community
Fr 473	Seminar in Western European Issues
or	} Advanced Area French
Ger 475	
or	
Span 479	
	Advanced Area German
	Advanced Area Spanish

One additional course from any department, Armnshp 440 or one open option, with approval of the faculty advisor.

Cadets electing this major must take either French, German, or Spanish as their foreign language. If a grade of "B" or better in the basic course is not attained, the 5-hour course must be replaced with two 2.5 hour advanced courses.





## GRADUATE PROGRAMS

### DIVISIONS OF BASIC AND ENGINEERING SCIENCES

#### Aeronautics and Astronautics

Cadets who demonstrate exceptional aptitude may be recommended to Purdue University as candidates for a Master's Degree in Aeronautics or Astronautics. Cadets who complete the requirements shown under the Major in Aeronautical Engineering or the Major in Astronautics will qualify for this program.

#### Mathematics

Cadets who demonstrate exceptional aptitude may be recommended as candidates for a Master's Degree. To qualify for this program, cadets must complete the requirements for a Major in Mathematics with appropriate options approved by a faculty advisor.

#### Physics

Cadets who demonstrate exceptional aptitude may be recommended to Ohio State University as candidates for a Master's Degree in Physics. To qualify for this program, cadets must complete the requirements for a Major in Physics with these substitutions:

Math 366	Advanced Calculus I (in place of Mech 361)
Phys 462	Electromagnetic Theory II (in place of one elective course)
Phys 563	Quantum Theory I (in place of Phys 473)

### DIVISION OF HUMANITIES

#### History

Cadets who fulfill the requirements of the graduate-level program in history will be eligible for an assignment to Indiana University to complete their Master's Degree in History. In addition to the core curriculum, the following courses are required to qualify for this program:

Hist 332	U. S. Diplomatic History
Hist 438	Western Institutions and Ideas
Hist 460	Military Ideas and Institutions
Hist 463	Unconventional Warfare
Hist 490	The Employment of Air Power
Hist 499	Independent Study
Hist 562	Colloquium: Military History of the U. S.
Hist 564	Colloquium: Area Military History



Advanced Foreign Language	
Geog 350	Systematic Cultural Geography
Philos 440	Ethics
Pol Sci 412	Defense Policy
Pol Sci 352	Modern Political Theory
One additional Area History course with the approval of the faculty advisor	
Hist 553	} Colloquium: Diplomatic History International Politics: Problems in the Maintenance of Security
or	
Pol Sci 565	
Foreign Language Reading I or II	

Cadets electing this program should choose an undergraduate foreign language in accordance with their area of special interest. Indiana University requires a reading knowledge of one modern foreign language for the master's degree. A language validation examination arrangement permits participating cadets to satisfy this requirement while at the Academy through successful completion of French 433 or 434, German 435 or 436, Russian 437 or 438, or Spanish 443 or 444 and the appropriate language examination.

Cadets who complete this program through the area history course will be awarded a Major in History.

## **DIVISION OF SOCIAL SCIENCES**

### **Economics**

Cadets who have completed the requirements given below may be recommended for continuation of the cooperative graduate program to complete a Master's Degree in Economics at a civilian university. In addition to the core curriculum, the following courses are required to qualify:

Econ 350	International Economics
Econ 433	Price Theory
Econ 456	Macroeconomic Theory
Econ 465	Introduction to Econometrics
Econ 466	Seminar in Econometrics
Five additional economics courses with approval of the faculty advisor	
Geog 350	Systematic Cultural Geography
Philos 440	Ethics
Pol Sci 412	Defense Policy
Math 232	Probability and Statistics
Pol Sci 352 or 381	Modern Political Theory-Classical Political Theory
Econ 551	Advanced Economic Theory I
Econ 552	Advanced Economic Theory II (2 course units)
Econ 553	Economic Development

Cadets who complete this program through Pol Sci 352 or 381 will be awarded a Major in Economics.

## International Affairs

Cadets who have completed the requirements given below may be recommended for continuation of the cooperative graduate program to complete a Master's Degree in International Affairs at a civilian university. In addition to the core curriculum, the following courses are required to qualify:

Pol Sci 412	Defense Policy
Pol Sci 352	Modern Political Theory
Pol Sci 456	International Organization and Military Security Systems
Pol Sci 475	Problems of the Developing Areas
Pol Sci 232	Contemporary Foreign Governments
Pol Sci 491	Problems in International Affairs
Pol Sci 381	Classical Political Theory
Geog 350	Systematic Cultural Geography
Philos 440	Ethics
Anthro 351	} Cultural Anthropology } Sociology
or	
Soc 360	
Econ 350	International Economics
Hist 332	United States Diplomatic History
Law 461	International Law
Econ 452	Economic Problems of Developing Areas
Pol Sci 561	Contemporary Political Theory
Pol Sci 565	International Politics: Problems in the Maintenance of Security
Pol Sci 566	International Politics: Theories and Concepts
Pol Sci 572	Soviet Foreign Policy
Foreign Language Reading I or II	

Cadets electing this program should choose their undergraduate foreign language in accordance with their area of special interest. A reading knowledge of one modern foreign language is required for the master's degree. A language validation examination arrangement permits participating cadets to satisfy this requirement while at the Academy through successful completion of Chinese 431 or 432, French 433 or 434, German 435 or 436, Russian 437 or 438, or Spanish 443 or 444 and successfully passing the appropriate language examination.

Cadets who complete this program through Econ 452 will be awarded a Major in International Affairs.

## Management

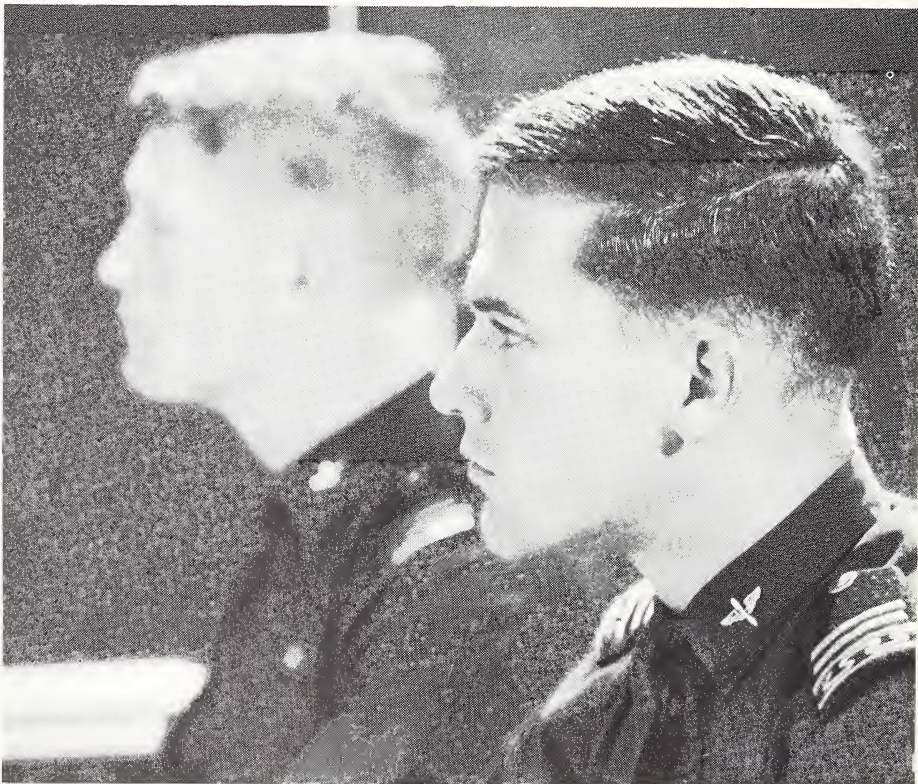
Cadets who have completed the requirements given below may earn credit toward a Master's of Business Administration or Master's of Science degree. Those who are selected to complete their master's degree will be sent to the University of California at Los Angeles. In

addition to the core curriculum, the following courses are required to qualify:

Geog 350	Systematic Cultural Geography
Philos 440	Ethics
Pol Sci 412	Defense Policy
Math 232	Probability and Statistics
Law 462	Government Contract Law
Psych 464	Command Leadership Problems
Econ 330	Principles of Accounting
Econ 430	Quantitative Decision Methods
Econ 432	Operations Analysis
Econ 439	Production Management
Econ 473	Managerial Accounting and Finance
Econ 456	Macroeconomic Theory
Soc 544 or 546	Seminar in Organization Theory-Seminar in Industrial Relations
Econ 534 or 536	Seminar in Logistics Management-Seminar in Management Theory and Analysis
Econ 433 or 435 or 458	Price Theory-Managerial Economics-Quantitative Economic Theory

Two additional courses in psychology or sociology as approved by the faculty advisor.

Cadets who complete this program will be awarded a Major in Engineering Management.





## ACADEMIC SERVICES

### The Frank J. Seiler Research Laboratory (OAR)

- COL. GAGE H. CROCKER, *Commander* — S.B., Massachusetts Institute of Technology; M.S., California Institute of Technology; M.S., Ph.D., University of Michigan
- LT. COL. HAROLD BECK, *Programs-Executive Officer* — B.A., Brooklyn College; M.A., University of California at Los Angeles
- LT. COL. RAY E. CHAPMAN, *Director of Computer Division* — B.S., University of Florida; M.S., Rensselaer Polytechnic Institute
- LT. COL. BERNARD S. MORGAN, JR., *Director of Aerospace Mechanics Division* — B.S., United States Naval Academy; M.S.E., Ph.D., University of Michigan
- MAJ. ALFRED D. BROWN, JR., *Director of Chemistry Division* — B.S., M.S., Ph.D., Auburn University

#### Research Associates

- MAJ. JOHN F. SCHAEFFER — B.S., United States Military Academy; M.S., Ph.D., Stanford University
- MAJ. JACK A. WINSTEAD — B.S., University of Kentucky; M.S., Ph.D., University of Illinois
- CAPT. JAMES R. DAVIDSON — B.A., University of Tulsa; M.S., Florida State University
- CAPT. DIRK H. deDOES — B.S., San Diego State College; M.S., University of Southern California
- CAPT. ROGER W. GALLINGTON — B.S., M.S., University of Illinois
- CAPT. ROGER A. GEESEY — B.S., Lehigh University; M.S., Stanford University
- CAPT. GEORGE R. HENNIG — B.S., United States Naval Academy; M.S., Air Force Institute of Technology
- LT. MICHAEL D. CILETTI — B.S., M.S., Ph.D., University of Notre Dame
- LT. DAVID FINKELMAN — B.S., Virginia Polytechnic Institute; S.M., Ph.D., Massachusetts Institute of Technology
- LT. FRANKLIN H. FRAYER — B.S., Ohio State University; Ph.D., Indiana University
- LT. GEORGE J. GAUTHIER — B.S., University of Notre Dame; Ph.D., University of New Hampshire
- LT. RALPH W. RUDOLPH — B.S., Pennsylvania State University; M.E., Ph.D., University of Michigan
- LT. KENNETH D. SENNE — B.S., M.S., Stanford University

The Frank J. Seiler Research Laboratory is one of three basic research laboratories operated by the Office of Aerospace Research, United States Air Force. It is named in memory of the late Colonel Frank J. Seiler, an Air Force research pioneer. The mission of the laboratory is to conduct research in chemistry, aerospace mechanics and applied mathematics. It also provides a means for supporting faculty and cadet research and disseminating the results to other Air Force agencies and the scientific community.



A resident staff of 15 research scientists works closely with faculty members and cadets on projects of mutual interest. A Burroughs B5500 digital computer, a low-density shock tube, and facilities for chemical synthesis and analyses are among the research equipment available for use by the laboratory staff, faculty, and cadets.

The digital computer of the Seiler Laboratory is a high speed general purpose system with two processors and a capability for multi-processing. The system has 24,000 words of core memory, 1.2 million words of on-line storage, four tape transports, a Calcomp plotter and is being expanded to provide 24 remote terminal consoles and display devices. In addition to supporting the research activities of the Seiler Laboratory, the computer is available for faculty and cadet research and education.

Because computers are used today in virtually every part of the Air Force, each cadet takes an introductory computer science course. Advanced computer science courses are available and the computer is used extensively for the analysis of data and the solution of problems in many of the scientific and engineering courses offered at the Academy.

### **Faculty Research**

MAJ. ROBERT W. BURTON, *Director of Faculty Research* — B.S., United States Naval Academy; E.E., S.M., Massachusetts Institute of Technology; Ph.D., Harvard University

The faculty research program is designed to keep faculty members current in their special fields and to provide an opportunity for faculty-cadet research. During the academic year a number of faculty officers pursue full-time research in the sciences, social sciences, and humanities. Additionally, faculty members conduct departmental research projects in conjunction with teaching duties. In the summer months numerous members of the faculty consult with other Air Force commands. Each summer approximately 70 cadets are given an opportunity for a research assignment.

### **Academic Counseling and Scheduling**

LT. COL. JOHN J. JONES, *Director of Counseling and Scheduling; Executive Officer Humanities Division; Third Class Committee Secretary* — A.B., Nebraska Wesleyan University; M.A., University of Missouri

LT. COL. JAMES E. BANKS, *Academic Scheduling Officer* — B.S., M.S., Ph.D., Stanford University

LT. COL. WALLACE E. FLUHR, *Executive Officer Engineering Sciences Division; Second Class Committee Secretary* — B.S., University of Kentucky; M.S., Ph.D., University of Illinois

MAJ. ROBERT E. GRASSBERGER, *Assistant Scheduling Officer* — B.S., United States Military Academy; M.S.M.E., Oklahoma State University

MAJ. WARREN L. SIMMONS, *Executive Officer Basic Sciences Division, First Class Committee Secretary* — B.S., Syracuse University; M.S., California Institute of Technology

MAJ. JACK L. WILSON, *Executive Officer Social Sciences Division; Fourth Class Committee Secretary* — A.B., M.A., University of North Carolina

The counselors serve as secretaries of the class committees and as executives of the academic divisions. They provide guidance to faculty advisors and squadron faculty officers in the administration of the academic majors programs. They counsel individual cadets on scheduling matters, grade deficiencies, and majors selections. The counselors also serve as representatives of the Dean of the Faculty on various boards and committees.

### **Instructional Technology**

LT. COL. HOWARD B. HITCHENS, JR., *Director of Instructional Technology; Tenure Associate Professor of Instructional Communications* — B.A., University of Delaware; M.A., Columbia University; Ph.D., Syracuse University

MAJ. CHESTER F. CATON, *Deputy for Media Services* — B.A., Wayne University; M.A., Ph.D., Northwestern University

MAJ. MICHAEL J. GRADY, JR., *Deputy for Instruction and Research* — Ed.B., Rhode Island College; M.A., Ph.D., University of Alabama

MAJ. STANLEY C. KAISER, *Associate for Audiovisual Communications* — A.B., M.A., University of Southern California

MAJ. DALE E. MCHENRY, *Chief of Instruction Division* — B.S., Bradley University; M.S., University of Southern California

MR. BILL HAZELWOOD, *Deputy for Visual Communications* — Eastern New Mexico University

The Directorate of Instructional Technology utilizes the most effective methods of technology to support the educational mission of the Air Force Academy.

The Visual Communications program provides visual materials and training devices for the instructional departments, fulfills briefing requirements of the faculty and staff, and creates designs for information and education programs of the Academy. The entire spectrum of visual presentation is utilized including graphic layouts, art, typography, still and motion pictures, three-dimensional aids, displays and exhibits.

Media Services manages support resources and operates the closed-circuit television system. Included among the support resources are a library of films, slides and pictorial materials as well as equipment items such as projectors and tape recorders. The

television system is equipped to televise up to twelve simultaneous programs to any area in the academic building. Academy instructors can prepare live or videotaped programs using options of multiple production methods.

The Instruction and Research program evaluates the latest educational technology and devices. Both the teaching process and the learning environment are investigated thoroughly with the objective of innovating new methods to improve the quality of instruction and the learning capacity of the student. The division conducts the following courses required for Fourth Class cadets:

*Instr Tech 101. Academic Skills* 0 (A101)  
Organization of study time, note taking, study methods, preparing for examinations, and listening skills. Accelerated reading skills to include rate and comprehension, surveying, and planning purpose. *Final exam. No sem hrs, fall.*

*Instr Tech 102. Basic Typing* 0 (A102)  
Basic typing limited to skills needed for theme, report, and military/personal correspondence typing. *No final. No sem hrs, fall.*

### **Air Force Academy Library**

COL. GEORGE V. FAGAN, *Director of the Library* — B.S., M.A., Temple University; M.A.L.S., University of Denver; Ph.D., University of Pennsylvania

MAJ. HARROLD S. SHIPPS, JR., *Assistant Director of the Library* — B.S., M.Ed., State College, Bridgewater, Mass.; M.S.P.A., George Washington University; M.A.L.S., University of Denver

CAPT. THOMAS W. WING, *Executive Officer* — B.A., University of Virginia

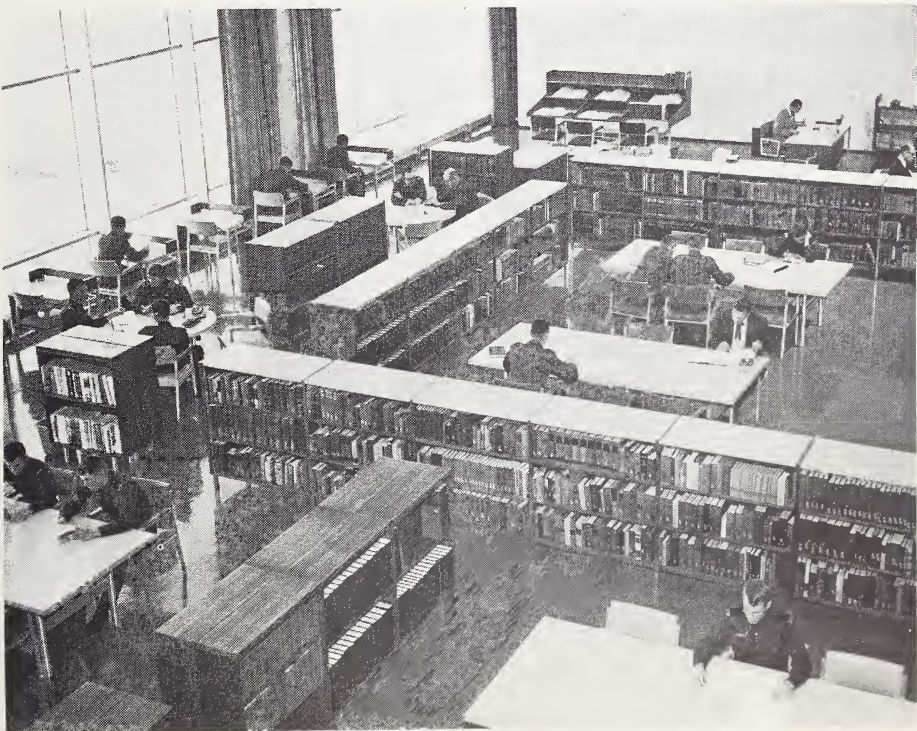
The Academy Library is utilized by all instructional areas of the Academy in the education of cadets. Through its professional staff, the library puts knowledge and ideas into use to serve cadets, the faculty and staff. The library maintains all material usually found in leading liberal arts and engineering colleges and universities, as well as an extensive reference and research collection in the fields of aerospace and aeronautical history. Ultimately, the library collection will exceed 500,000 volumes. At present, more than 250,000 volumes line the open shelves.

The library covers an area of more than 78,000 square feet and has a seating capacity for 1,100 readers. A spiral stairway provides access to the three floors of the library located at the north end of Fairchild Hall, the academic building. Included in the library are the reference area, periodical reading area, seminar areas, the current situation room, the special collection room containing items pertinent to the growth of the Air Force, rooms for maps and microfilms, and a listening room with recordings of classical music, poetry, plays and speeches.



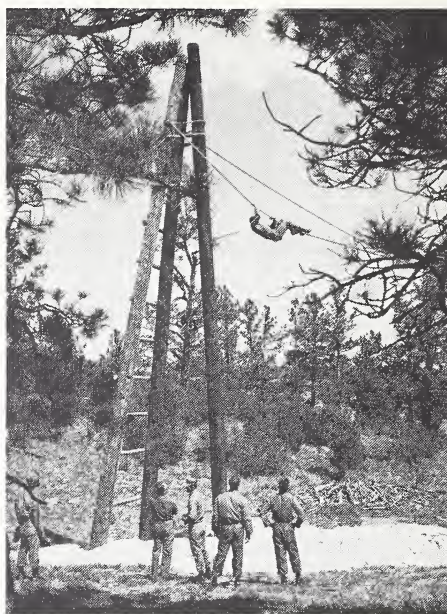
The Academy Library, with its branch and field libraries, is in reality a centralized integrated library system unique in the Air Force. The Academy has four branch libraries to serve specialized needs: the Community Library, equivalent to a base library at most Air Force installations; the Law Library, used by cadets in their study of law as well as by the Staff Judge Advocate in the practice of law for military personnel; and a Medical Library and a Patients' Library located in the Academy Hospital. In addition, there are 52 field libraries of reference collections located in the academic departments and staff agencies throughout the Academy.

The library is a selective depository for U. S. Government Documents and for United Nations Documents. Special bibliographies in many subject areas and periodic annotated listings of current acquisitions are published by the library in conjunction with the academic departments. A library handbook is available for the guidance of all users of the library. Arrangements for interlibrary loans in the Rocky Mountain Region are made by the Bibliographical Center in Denver. The Academy Library holds a membership in the Bibliographical Center and is able to arrange loans of books and periodicals from library resources all over the United States and Canada.





# Leadership and Military Training





**Brig. Gen. Robin Olds**  
**Commandant of Cadets**

B.S., United States Military Academy

COL. JOHN R. GEYER, *Vice Commandant of Cadets* — B.S., United States Military Academy

COL. HARRISON H. D. HEIBERG, JR., *Director of Cadet Operations and Plans* — B.S., United States Military Academy; M.A., University of Maryland

COL. ROBERT L. HUNT, *Director of Cadet Personnel and Administration* — Sacramento State College

COL. JOHN M. TORBET, *Director of Materiel* — A.B., Michigan State University; M.S., Air Force Institute of Technology

LT. COL. STANLEY C. BECK, *Executive for Honor and Ethics* — B.S., United States Military Academy; M.S., George Washington University

MAJ. LOREN E. DECKER, *Executive to the Commandant* — B.S., M.Ed., University of Illinois; M.B.A., George Washington University

Leadership and Military Training affords experience in leadership, promotes professional attitudes, and provides the basic military knowledge required of an Air Force officer. The fulfillment of these objectives is the responsibility of the Commandant of Cadets and the organization under his command. The Commandant's program includes instruction in airmanship, command training and military training. It also encompasses leadership experience in the Air Force Cadet Wing.

## DEPARTMENT OF MILITARY INSTRUCTION

COL. RICHARD G. NEWELL, *Deputy Commandant for Military Instruction* — B.S., United States Military Academy

MAJ. ROBESON S. MOISE, *Executive Officer* — B.A., University of the South; M.A., Memphis State University

## Military Training Division

LT. COL. HARVEY H. HOGUE, *Chief of Military Training Division* — B.S., United States Naval Academy; M.B.A., University of Connecticut

CDR HERBERT E. WHYTE (USN), *Senior Naval Representative* — B.S., United States Naval Academy; M.A., George Washington University

MAJ. IRVING A. BEAUCHAMP, JR. (USA), *Senior Army Representative* — B.S., United States Military Academy



### Staff Officers

MAJ. RONALD M. CLEMENTS — B.S., University of Georgia  
MAJ. MICHAEL J. DUGAN — B.S., United States Military Academy  
MAJ. JAMES M. DUNN, JR. — B.G.E., University of Omaha; M.S., George Washington University  
MAJ. JAMES R. HARDING — B.Sc., Ohio State University; M.Sc., George Washington University  
MAJ. KENNETH L. HOLDEN — B.S., United States Naval Academy; M.S.B.A., George Washington University  
MAJ. FRED N. HOPEWELL — B.S., United States Naval Academy  
MAJ. JERRY A. NOHE — B.B.A., M.S.B.A., George Washington University  
MAJ. PAUL E. VOGEL — B.S., North Dakota State University  
SQN. LDR. HARRY J. RIDOUT (RAF) — Royal Air Force College, Cranwell  
CAPT. JOHN H. ROBERTS — A.B., Washington University; M.B.A., New York University

### Instructors

MAJ. DALE N. AMEND — B.S., Colorado State University; B.S., University of Colorado  
MAJ. WILLIAM F. BAIRD, JR. — B.S., Texas Christian University  
MAJ. JIMMY B. PICKENS — B.S., New Mexico State University  
MAJ. WARREN N. SAMS, JR. — A.B., Duke University  
MAJ. HUGH J. SOCKS, JR. — B.S., United States Military Academy  
MAJ. GRANT C. STANFILL — B.S., Oklahoma State University  
CAPT. BRYANT P. CULBERSON — B.S., United States Air Force Academy  
CAPT. ROBERT E. CULTON — B.A., University of New Hampshire  
CAPT. GEORGE E. ELSEA — B.S., United States Air Force Academy  
CAPT. RONALD J. KOS — B.S., United States Air Force Academy  
CAPT. JERRY D. RICHARDS — B.S., Memphis State College  
CAPT. KENNETH R. SMITH — B.S., United States Air Force Academy  
CAPT. FRANCIS M. WRIGHT, JR. — B.S., United States Military Academy

### MILITARY TRAINING

*Mil Tng 100. Basic Cadet Training* (X100)  
Transition from civilian to military life. Indoctrination in the overall Academy program, cadet regulations, the Honor Code, manual of arms, drill, customs and courtesies, and other general military subjects. Introduction to basic Air Force weapons, firing course (rifle and pistol), survival training, field encampment, altitude chamber, and orientation flights in T-33 aircraft. 5 sem hrs, summer.

*Mil Tng 115. United States, Allied and Communist Military Forces I* 0 (X115)  
A study of the national security organization, primarily military forces, in preparation for the field trip to combat and support commands of the USAF. Includes the capabilities of major USAF combat and support commands. No final. ½ sem hr, fall.

*Mil Tng 116. United States, Allied and Communist Military Forces II* 0 (X116)  
Continuation of Mil Tng 115. Includes U. S. Army, U. S. Navy, and foreign military forces. No final. ½ sem hr, spring.

*Mil Tng 200. Third Class Summer Training* (X200)  
Two and one-half week field trip in the United States to combat and support commands of the USAF. Three weeks of evasion-resistance, air base security and weapons training. No final. 4½ sem hrs, summer.

*Mil Tng 220. Military Instructor Training* 0 (X220)  
Preparation for instructional duties with cadet training programs. Accomplished through classroom practice teaching exercises. *No final. 1 sem hr, fall and spring.*

*Mil Tng 300. Second Class Summer Training* (X300)  
A diversified course that includes leadership duties and military instruction. Participation in one or more of the following programs: leadership positions with underclasses, duty with an Air Force unit, basic airborne training, parachute jumpmaster training, parachuting instructor, underwater demolition training, jungle operations, and navigator/soaring training. *No final. 4 sem hrs, summer.*

*Mil. Tng 320. USAF Combat Operations and Tactics* (X320)  
Offensive and defensive employment of USAF aerospace power. Includes planning, support, and procedures incident to generating and launching the USAF combat forces. *Final exam. 1 sem hr, fall and spring.*

*Mil. Tng 400. First Class Summer Training* (X400)  
A diversified course that includes leadership duties, military instruction, and research projects. Participation in one or more of the following programs: leadership positions with underclasses, leadership position in basic military training schools, duty with an Air Force unit, airborne training, parachute jumpmaster training, parachuting instructor, and summer research projects. *5 sem hrs, summer.*





## **COMMAND TRAINING**

*Cmd Tng 101. Command Training I* 0 (X101C)  
Instruction and participation in survival-evasion and land navigation exercises. Includes instruction in application of honor, ethics, decorum; command subjects on cadet and military life; parades, drill, and inspection. 1½ sem hrs, fall and spring.

*Cmd Tng 201. Command Training II* 0 (X201C)  
Preparation for leadership positions in the Cadet Wing. Includes instruction and participation in advanced land navigation and air base security tactics; parades and inspections; honor, ethics and decorum; and preparation for summer training programs. 1½ sem hrs, fall and spring.

*Cmd Tng 301. Command Training III* 0 (X301C)  
Cadets instruct in basic organization of the Air Force and conduct survival-evasion and land navigation exercises. Includes parades, drill, and inspections; honor and ethics instruction; command and administration of the Cadet Wing; preparation for summer training programs. 1½ sem hrs, fall and spring.

*Cmd Tng 401. Command Training IV* 0 (X401C)  
Cadets lead land navigation and air base security exercises and conduct instruction in honor and ethics. Includes command and administrative functions of the Cadet Wing; parades, drill, and inspections; instruction on officer pay, schooling, and career planning. 1½ sem hrs, fall and spring.

## **Airmanship Division**

LT. COL. ROBERT K. McCUTCHEN, *Chief of Airmanship Division* — B.S., United States Military Academy

MAJ. FRANCIS E. BRANDON, JR., *Chief of Aviation Branch* — B.S., University of New York

MAJ. JOHN J. GARRITY, *Chief of Parachute Branch* — B.S., M.S., North Texas State University

CAPT. ROBERT F. COADY, *Assistant, Aviation Branch* — B.S., Louisiana State University

## **AIRMANSHIP**

*Armshp 370. Flight Indoctrination* 0 (X370A)  
Provides the cadet with an appreciation of aviation skills, aircrew responsibilities, and jet aircraft capabilities. Four flights in T-33 aircraft with a competent jet pilot for about 6:00 total flying hours and 7:20 hours of associated flight line instruction. Includes aircraft familiarization, cross country, night, and instrument flight. ½ sem hrs, fall and spring.

*Armshp 440. T-41 Flight Training* 1 (X440A)  
Required course for all First Classmen who volunteer for Air Force pilot training following graduation. Includes dual instruction, ground school, and solo flight training with option for an FAA pilot certificate. 2½ sem hrs, summer, fall or spring.

*Armshp 450. Airplane Rating, Private* 0 (X450A)  
Dual instruction, ground school, and solo flight training to complete the requirements for an FAA pilot certificate. This training is conducted with the USAFA Aero Club through the Cadet Aviation Club (a cadet extra-curricular activity) and is available to a limited number of cadet volunteers. Any cadet who possesses an FAA private pilot airplane rating may validate this course. 2½ sem hrs, summer, fall or spring.

*Armnsbp 451. Glider Rating, Private* (X451A)

Dual instruction, ground school and solo flight training to complete the requirements for an FAA Pilot Certificate-Glider Rating, Private. 1½ sem hrs. summer, fall or spring.

*Armnsbp 452. Basic Airborne Training* (X452A)

A three-week course at the U. S. Army Infantry School, Fort Benning, Georgia. Includes basic skills of static line parachute jumping. (Credit awarded only when course is completed in addition to summer training.) 2½ sem hrs, summer.

*Armnsbp 460. Airplane Rating, Commercial* (X460A)

Dual instruction, ground school, and solo flight training to complete the requirements for an FAA Pilot Certificate-Airplane Rating, Commercial. *Prereq: Armnsbp 450 or FAA Private Certificate.* 1½ sem hrs, summer, fall or spring.

*Armnsbp 461. Glider Rating Commercial* (X461A)

Dual instruction, ground school, and solo flight requirements for a Pilot Certificate-Glider Rating, Commercial. *Prereq: Armnsbp 451 or FAA Pilot Certificate-Glider Rating, Private.* 1 sem hr, fall or spring.

*Armnsbp 470. Airplane Rating, Instrument* (X470A)

Dual instruction, ground school, and instrument trainer instruction to complete the requirements for an FAA Pilot Certificate, Instrument Rating. *Prereq: Armnsbp 450 or FAA Private Pilot Certificate.* 1½ sem hrs, summer, fall or spring.

*Armnsbp 471. Glider Rating, Flight Instructor* (X471A)

Dual instruction, ground school, and solo flight requirements for an FAA Flight Instructor Certificate-Glider Rating. *Prereq: Armnsbp 461 or FAA Pilot Certificate-Glider Rating, Commercial.* 1 sem hr, fall or spring.



*Armnsnp 480. Airplane Rating, Flight Instructor* (X480A)  
Meeting the requirements for an FAA Flight Instructor Certificate-Airplane Rating. *Prereq: Armnsnp 460. 1½ sem hrs, summer, fall or spring.*

*Armnsnp 490. Advanced Parachute Training* (X490A)  
Instruction in techniques of parachuting more advanced than taught in basic airborne training. Familiarizes the cadet with free fall parachuting as it pertains to his future career as an Air Force officer. Completion of 10 jumps required. (Credit awarded only when course is completed in addition to summer training.) *Prereq: Armnsnp 452. 1 sem hr, summer, fall or spring.*

*Armnsnp 491. Precision Parachute Training* (X491A)  
Ground and aerial training which allows cadets to progress from basic free fall training through delayed free falls, controlled body maneuvers, precision landing, and competitive parachuting. Requirements are fulfilled toward Class B, C and D Parachute Club of America FAI International Parachuting Licenses. *Prereq: Armnsnp 452 and 490. 1 sem hr, fall or spring.*

*Armnsnp 492. Jumpmaster Parachute Training* (X492A)  
Trains selected cadets as assistant instructors for Armnsnp 490. Consists primarily of instruction techniques, jumpmaster procedures, and proficiency jumps. Completion of 15 jumps terminating in award of jumpmaster rating. *Prereq: Armnsnp 452, 490 and 491. Semester hours included in Mil Tng 300 or 400, summer.*

*Armnsnp 493. Parachute Instructor* (X493A)  
Open to selected cadets who wish to serve as assistant instructors in AM 490. *Prereq: Armnsnp 452, 490 491 and 492. 2 sem hrs, summer, fall or spring.*

## Navigation Division

COL. KENNETH A. FUGETT, *Chief of Navigation Division* — B.S., University of Kentucky; M.S., University of Minnesota

### Staff Officers

LT. COL. EDWARD R. THERKELSEN, *Planetarium Director* — B.S., University of Nevada; M.Sc., Ohio State University

MAJ. ALVIN E. MATHER — A.B., Washburn University

MAJ. WESLEY H. JORGENSEN — B.S., San Jose State College; M.S., Oklahoma State University

MAJ. EDWARD E. JERNIGAN — B.S., East Carolina College; M.E., Eastern New Mexico University

MAJ. WESLEY A. NEWSOME, JR. — B.S., United States Naval Academy; M.S.E.E., University of Illinois; M.B.A., George Washington University

MAJ. GEORGE J. VEHR — B.S., University of Idaho

CAPT. THOMAS R. BRISCOE — B.B.A., University of Oklahoma

### Instructors

MAJ. LEO J. JOHNSON — B.S.C.E., Washington University; M.S.A.E., Air Force Institute of Technology

MAJ. WILLIAM C. McPEEK — B.S., United States Military Academy; M.Ed., Westfield State College, Mass.

MAJ. JAMES B. SANDERS, JR. — B.S., University of Tennessee

MAJ. GILBERT K. ST. CLAIR — B.A., University of New Mexico

CAPT. KENNETH W. BROTONOV — B.S.A.E., University of Washington; M.S.A.E., Air Force Institute of Technology

CAPT. WILLIAM A. GERICKE, JR. — B.S., Pennsylvania State University

CAPT. DON E. KOSOVAC — B.A., University of California at Berkeley

CAPT. JOHNNIE I. LOUDERBACK — B.A., University of Puget Sound



## Navigation

### *Nav 371. Descriptive Astronomy*

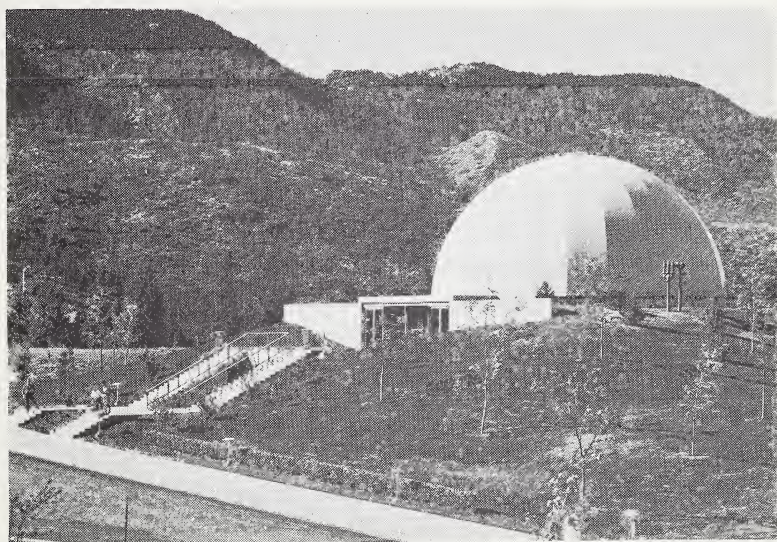
1 (W371)

Physical aspects of planets and their satellites, comets and meteors, the sun, and laws governing planetary motions. Historical development of astronomy from antiquity to present. Night observation and instrumented measurement of celestial phenomena. Field trip to Mt. Palomar in spring for top 100 students of both fall and spring semesters. *Final exam. 2½ sem hrs, fall or spring.*

### *Nav. 470. Navigation Indoctrination*

1 (W470)

Introduction to basic navigation concepts and equipment. Includes classroom instruction, trainer periods, and six 5-hour flight missions in T-29 aircraft. Covers navigation from basic dead reckoning through advanced systems with emphasis on areas applicable to potential pilots and navigators. Provides experience in a flying environment as a crew member and develops insight into the requirements and responsibilities of a rated specialty. *Final exam. 2½ sem hrs, summer, fall or spring.*



## The Academy Planetarium

LT. COL. EDWARD R. THERKELSEN, *Planetarium Director* — B.S., University of Nevada; M.Sc., Ohio State University

MAJ. LEO J. JOHNSON, *Assistant Planetarium Director* — B.S.C.E., Washington University; M.S.A.E., Air Force Institute of Technology

The Planetarium is utilized in the navigation instruction of cadets. In addition it is used for educational demonstrations to school groups and the general public. Annual attendance is over 100,000. The Spitz projector enables the astronomy instructor to simulate a multitude of realistic sky effects on the 50-foot dome. Movement of planets, comets, meteor showers, constellations, sunrise and sunset can be duplicated for past, present or future time periods.



## CADET WING TRAINING

- COL. ARTHUR R. MOORE, JR., *Deputy Commandant for Cadet Wing* — B.S., United States Military Academy; M.S., George Washington University
- MAJ. VAN L. CRAWFORD, JR., *Executive to Deputy Commandant* — A.B., Grinnell College

### **Air Officers Commanding Cadet Groups and Squadrons**

#### **Group 1**

- COL. CECIL E. FOX, *AOC Group 1* — B.S., United States Military Academy; M.S., Stanford University
- MAJ. JAMES A. GRAVETTE, *Deputy AOC Group 1* — B.S., Miami University, Ohio; M.A., University of Denver
- MAJ. DALE W. THOMPSON, JR., *AOC Sq. 1* — B.S., United States Air Force Academy
- CAPT. KENT MONTAVON, *AOC Sq. 2* — B.S., United States Air Force Academy
- MAJ. THAIR D. LAYNE, *AOC Sq. 3* — B.S., Brigham Young University
- CAPT. ALEXANDER D. BACHE, *AOC Sq. 4* — B.A., San Jose State College
- MAJ. CHARLES H. GREENLEY, *AOC Sq. 5* — B.A., University of Oregon; M.S.P.A., George Washington University
- CAPT. ARLO WENSTRAND, *AOC Sq. 6* — B.S., Oregon State University

#### **Group 2**

- LT. COL. FRANCIS R. NEALON, *AOC Group 2* — B.S.A., University of Arkansas
- MAJ. FRED M. DAVIS, *Deputy AOC Group 2* — B.S., Butler University; M.S., George Washington University
- CAPT. HAROLD N. CAMPBELL, *AOC Sq. 7* — B.S., United States Air Force Academy
- MAJ. MILTON A. MELVILLE, *AOC Sq. 8* — B.S., University of Utah
- MAJ. JOEL R. CAMPIS, *AOC Sq. 9* — B.S., United States Military Academy
- MAJ. JOHN J. CLUNE, *AOC Sq. 10* — B.S., United States Naval Academy; M.S.E.E., University of Southern California
- CAPT. ANTHONY W. SEIZYS, *AOC Sq. 11* — B.S., United States Air Force Academy
- MAJ. JUDSON C. FAURER, *AOC Sq. 12* — B.S., United States Military Academy; M.B.A., Ohio State University

#### **Group 3**

- LT. COL. JOHN D. PENNEKAMP, *AOC Group 3* — B.S. United States Military Academy
- LT. COL. MELBOURNE KIMSEY, *Deputy AOC Group 3* — B.S.A., University of Georgia; M.S.B.A., George Washington University
- CAPT. GEOFFREY C. DAVIS, JR., *AOC Sq. 13* — B.S., United States Military Academy; M.S.A.E., University of Southern California
- MAJ. CHARLES H. DAVIS IV, *AOC Sq. 14* — B.S., United States Military Academy
- LT. COL. CLYDE H. GARNER, *AOC Sq. 15* — B.S., University of North Carolina; M.A., George Washington University
- MAJ. ROBERT L. HULL (USA), *AOC Sq. 16* — B.S., United States Military Academy
- CAPT. JAMES F. KNIGHT, *AOC Sq. 17* — B.S., United States Military Academy
- MAJ. VERNON L. FRYE, *AOC Sq. 18* — B.S., University of Minnesota; M.A., George Washington University

#### **Group 4**

- LT. COL. ROBERT N. KELLEY, *AOC Group 4* — B.S., United States Military Academy
- MAJ. MORRIS T. WARNER, JR., *Deputy AOC Group 4* — B.S., United States Military Academy
- CAPT. THOMAS R. KLING, *AOC Sq. 19* — B.S., United States Military Academy
- MAJ. ROBERT L. RODEE, *AOC Sq. 20* — B.A., San Francisco State College
- MAJ. JOHN L. ESPENSHIED, *AOC Sq. 21* — B.B.A., Southern Methodist University

CAPT. NEIL P. DELISANTI, *AOC Sq. 22* — B.S., United States Air Force Academy

MAJ. ROBERT C. OAKS, *AOC Sq. 23* — B.S., United States Air Force Academy; M.B.A., Ohio State University

MAJ. ALLEN G. MYERS III, *AOC Sq. 24* — B.S.A.E., Auburn University; M.S.A.S.E., University of Oklahoma

#### Group 5

LT. COL. HARVEY W. PROSSER, JR., *AOC Group 5* — B.S., United States Military Academy; M.A., Columbia University

MAJ. FREDERICK W. FRANCKE III, *Deputy AOC Group 5* — B.S., Rutgers University

MAJ. JAMES A. MCGINN (USMC), *AOC Sq. 25* — B.S., United States Naval Academy

MAJ. DONALD D. WHITE, *AOC Sq. 26* — B.S.I.E., Texas Technological College

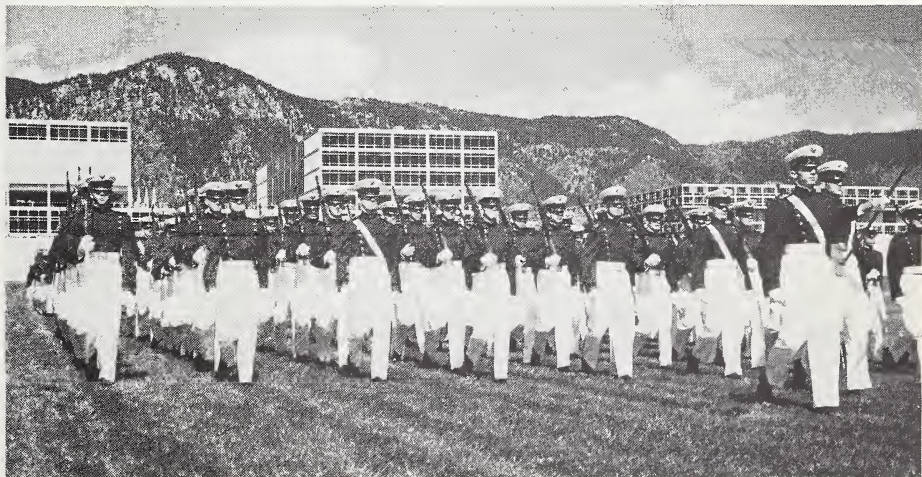
CAPT. ANTHONY J. BURSHNICK, *AOC Sq. 27* — B.S., United States Air Force Academy

MAJ. EDWARD G. BARNES, *AOC Sq. 28* — B.S., Newberry College

MAJ. WILLIAM D. McWILLIAMS III, *AOC Sq. 29* — B.S.E., United States Military Academy; M.S.B.A., George Washington University

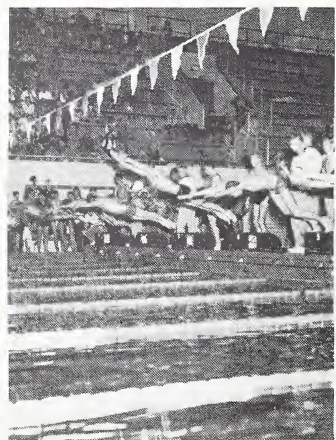
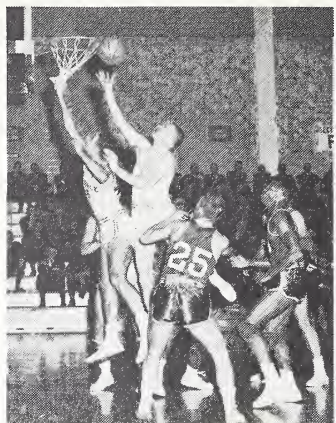
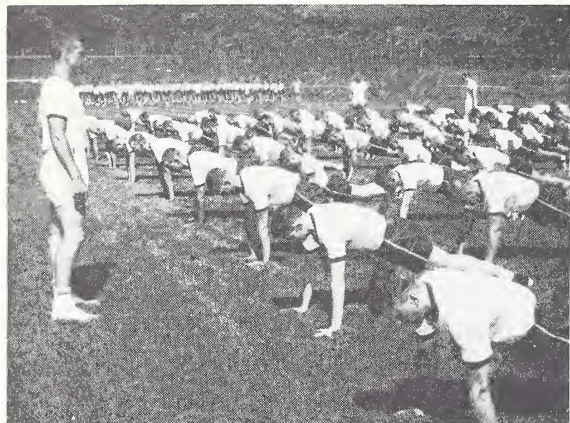
MAJ. BENJAMIN R. FULLER III, *AOC Sq. 30* — B.S., The Citadel

Training in command and staff functions within the Cadet Wing affords opportunities for cadets to practice leadership techniques and to develop traits of character and discipline. Supervision of Cadet Wing Training is the responsibility of Air Officers Commanding (AOC) the cadet groups and squadrons. These officers provide guidance to cadet officers who administer the squadrons. They monitor the progress of all cadets assigned to their respective units in every facet of cadet life. Particular attention is given to motivation of cadets under their command through encouraging them to excel individually and as a squadron unit. Twice each year cadets are rated to determine how effective they have been in leadership and military performance. Cadets rate each other within their own squadrons, and the AOC makes an independent evaluation of each cadet. Each year all squadrons compete for the honor of outstanding squadron in the areas of drill, intramurals, military achievement, intercollegiate athletics, and academic achievement.





# Physical Education and Athletics



**Col. Francis E. Merritt**  
**Director of Athletics**

B.S., United States Military Academy  
 M.A., George Washington University



- LT. COL. RALPH PITTMAN, *Business Manager* — B.S., University of North Carolina; M.S., George Washington University
- MAJ. DAVID M. McDANIEL, *Comptroller* — B.S., University of Tulsa; M.S., Air Force Institute of Technology
- CAPT. JAMES S. KEATING — B.A., Omaha University
- GORDON W. CRANDELL, *Sports Information Director* — B.A., Western State College
- JOHN SCHWALL, *Special Assistant to the Director of Athletics* — B.S., Eastern Michigan University

## DEPARTMENT OF PHYSICAL EDUCATION

- LT. COL. CHARLES W. OLIVER, *Assistant Director of Athletics and Head of Department of Physical Education* — B.S., United States Military Academy; M.A., Columbia University
- LT. COL. WILBERT H. RICHARZ, *Deputy Head of the Department* — B.S., Trinity University; M.S., University of Oregon
- MAJ. ANTHONY R. CILLO, *Chief of Instruction Division* — B.S., Rutgers University; M.S., University of Illinois
- MAJ. LEROY J. SALEM, *Chief of Intramural Division* — B.S., M.A., State University of Iowa
- MAJ. HAROLD J. WALTER, *Chief of Research and Evaluation Division* — B.S., Springfield College; M.S., Indiana University

### Instructors

- MAJ. EMIL R. ANASTASIO — B.S., University of Connecticut; M.S., University of Colorado
- MAJ. PAUL F. ARATA, *Swimming Coach* — B.S., North Carolina State University; M.S., University of New Mexico
- MAJ. LAURENCE H. DIETZEN — B.S., University of Houston; M.A., George Washington University
- MAJ. JAMES H. KEATING, JR., *Lacrosse Coach* — B.S., University of Maryland
- MAJ. MAX D. KENNEDY — B.S., University of Nebraska; M.S., University of Colorado
- MAJ. RENE J. MILLER, *Baseball Coach* — B.S., University of California at Los Angeles; M.S., University of Colorado
- MAJ. DONALD J. MINIHAN — B.S., University of Pittsburgh
- CAPT. JAMES B. BROOKS — B.S., United States Air Force Academy
- CAPT. JOHN T. CARNEY — B.S., University of Arizona



CAPT. EDWIN R. CLIATT — B.S., University of Maryland; M.S., University of Michigan  
 CAPT. DAVID A. EDSTROM — B.S., University of Oregon  
 CAPT. HENRY P. EGAN — B.S., United States Naval Academy  
 CAPT. HENRY J. EICHIN — B.S., Springfield College; M.S., Columbia University  
 CAPT. RICHARD B. GARVER — B.S., Ohio State University; M.S., University of Florida  
 CAPT. BRUCE S. HARGER — B.A., Denison University; M.Ed., Pennsylvania State College  
 CAPT. JOHN D. LOEWENBERG, *Soccer Coach* — B.S., Springfield College; M.A., University of Connecticut  
 CAPT. JAMES R. MARETT — A.B., University of California at Berkeley  
 CAPT. PATRICK H. MCHARGUE — A.B., San Fernando Valley State College; M.A., University of Southern California  
 CAPT. EUGENE F. MIRANDA — B.A., M.A., San Jose State College  
 CAPT. JOHN D. PIETILA — B.S., Otterbein College; M.S., University of North Dakota  
 CAPT. JOSEPH V. POTTER — B.A., San Diego State College  
 CAPT. RUDOLPH M. RUANA, *Ski coach* — B.A., Montana State University  
 CAPT. ORWYN SAMPSON — B.S., M.S., University of California at Los Angeles; Ph.D., University of Oregon  
 CAPT. JOHN W. SIEMANN — B.S., Manhattan College; M.Ed., Pennsylvania State University  
 CAPT. KEITH A. STOWERS — B.S., The Citadel  
 CAPT. GERALD R. WHEELER — B.S., M.A., University of Alabama  
 LT. WALTER H. OEHRLEIN — B.S., United States Military Academy  
 ARNE U. ARNESEN, *Track and Cross Country Coach* — B.S., University of Wisconsin; M.Ed., Springfield College  
 KARL KITT, *Wrestling Coach* — B.S., Southwestern State College, Oklahoma  
 NICHOLAS G. TOTH, *Fencing Coach* — Central Institute of Sports and Fencing Academy, Budapest, Hungary

The cadet physical education program is based on the premise that outstanding leadership qualities are developed through physical fitness and athletic participation. Instruction is given in a number of areas of physical education. The laboratory application of this instruction is provided through intramural sports competition. Cadets are encouraged to maintain high standards of physical fitness as professional officers by utilizing skills they develop in carry-over sports.

#### PHYSICAL EDUCATION

- Phy Ed 104. Individual Carry-Over Skills* 0 (Y104)  
 Instruction in one of these carry-over sports: tennis, golf, squash, or handball. Remedial instruction in swimming and physical fitness for designated cadets.  $\frac{1}{4}$  sem hr, May.
- Phy Ed 105. Competitive Athletics* 0 (Y105)  
 Intramural and/or intercollegiate athletics. 1 sem hr, fall.
- Phy Ed 106. Competitive Athletics/Physical Fitness Test* 0 (Y106)  
 Intramural and/or intercollegiate athletics plus passing cadet minimums on Physical Fitness Test. 1 sem hr, spring.

*Phy Ed 110. Basic Cadet Physical Training* 1 (Y110)  
Preparation for strenuous physical education and athletics by development of physical strength, endurance, agility, and coordination by means of conditioning exercises, obstacle course, and sports competition. Physical fitness and swimming tests. Special instruction in swimming and conditioning as needed. 2 sem hrs, summer.

*Phy Ed 120. Gymnastics, Wrestling, Boxing, Swimming* 0 (Y120)  
Instruction in gymnastics, wrestling, boxing, and swimming. 1 sem hr, fall and spring.

*Phy Ed 205-206. Competitive Athletics/Physical Fitness Test* 0 (Y205-Y206)  
Intramural and/or intercollegiate athletics plus passing cadet minimums on Physical Fitness Test. 1 sem hr, fall; 1 sem hr, spring.

*Phy Ed 220. Swimming, Judo, and Two Carry-Over Skills.* 0 (Y220)  
Instruction in swimming, judo, and two carry-over skills (tennis, golf, squash, or handball). Carry-over skill received in Phy Ed 104 will not be repeated. 1 sem hr, fall and spring.

*Phy Ed 305-306. Competitive Athletics/Physical Fitness Test* 0 (Y305-Y306)  
Intramural and/or intercollegiate athletics plus passing cadet minimums on the Physical Fitness Test. 1 sem hr, fall; 1 sem hr, spring.

*Phy Ed 320. Unarmed Combat, Instructor Training, Volleyball, and One Carry-Over Skill* 0 (Y320)  
Instruction in unarmed combat, instructor training, volleyball, and one remaining carry-over skill (tennis, golf, squash, or handball). 1 sem hr, fall and spring.

*Phy Ed 404. Elective or Physical Fitness Conditioning* 0 (Y404)  
Choice of six electives (tennis, golf, diving, scuba, fencing, volleyball) or physical fitness conditioning. ¼ sem hr, May.

*Phy Ed 405-406. Competitive Athletics/Physical Fitness Test* 0 (Y405-Y406)  
Intramural and/or intercollegiate athletics plus passing cadet minimums on the Physical Fitness Test. 1 sem hr, fall; 1 sem hr, spring.

*Phy Ed 420. Advanced Unarmed Combat, Badminton, Physical Fitness Methods, and Elective* 0 (Y420)  
Instruction in advanced unarmed combat, badminton, physical fitness methods, and an elective. Prereq: Phy Ed 104, 220, or 320 as pertains to carry-over skills. 1 sem hr, fall or spring.

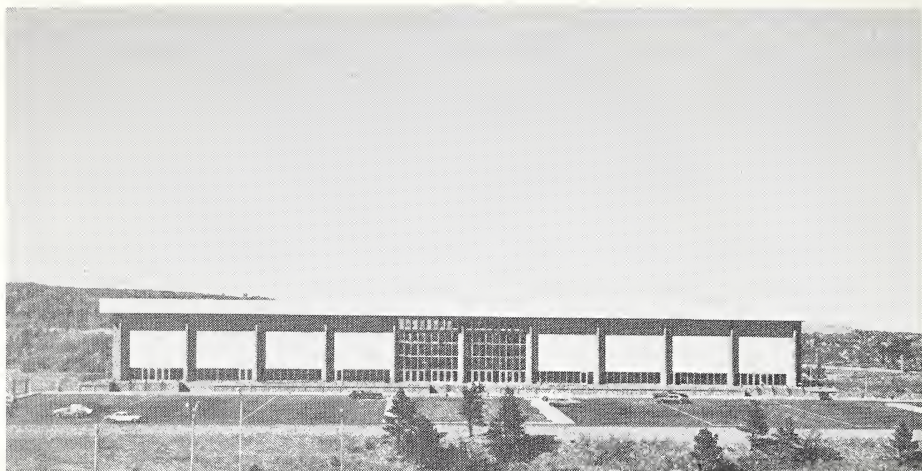
### **INTRAMURAL ATHLETICS**

Intramural participation provides the cadet with broad experience in both team and individual sports. Each cadet who is not engaged in an intercollegiate sport is required to compete in intramural athletics. Each squadron in the Cadet Wing is represented by a team in every sport conducted during the fall, winter and spring seasons. Cadets administer the program under the supervision of physical education instructors. The program gives the cadets experience in coaching teams, officiating contests, and administering athletic programs. The schedule of intramural athletics is as follows:

*Fall* — football, lacrosse, flickerball, and tennis

*Winter* — boxing, wrestling, water polo, handball, and squash

*Spring* — rugby, basketball, swimming, soccer, and Cadet Wing open boxing championships



New Academy Fieldhouse

## INTERCOLLEGIATE ATHLETICS

### Varsity Football

BEN MARTIN, *Head Coach* — B.S., United States Naval Academy

JACK BRALEY, *Assistant Coach* — B.S., University of Nebraska

ELDON HILLSTROM, *Assistant Coach* — B.S., University of Oregon

LELAND KENDALL, *Assistant Coach* — B.S., Oklahoma State University

JOE MOSS, *Assistant Coach* — B.S., University of Maryland

CAPT. BERNARD E. RAETZ, *Assistant Coach* — B.S., St. Thomas College

### Junior Varsity Football

CAPT. MARTIN BEZYACK, *Coach* — B.S., University of Utah

### Freshman Football

JIM BOWMAN, *Head Coach and Chief of Candidate Counseling* — B.S., University of Michigan

CAPT. JAMES A. LEACH, *Assistant Coach* — B.S., United States Naval Academy; M.B.A., University of Connecticut

CAPT. WILLIAM D. LEGGETT, JR. — B.S., Ohio State University

CAPT. WILLIAM L. McLAIN, JR., *Assistant Coach* — B.S., United States Air Force Academy

CAPT. GILES WIDEMAN II, *Assistant Coach* — B.S., United States Air Force Academy

LT. MICHAEL J. GALBREATH, *Assistant Coach* — B.S., United States Air Force Academy

### Basketball

LT. COL. (RET.) ROBERT B. SPEAR, *Head Varsity Coach* — A.B., DePauw University

MAJ. BASIL L. CIRIELLO, *Assistant Varsity Coach* — B.A., George Washington University

CAPT. DONALD L. WOLFSWINKEL, *Junior Varsity Coach* — B.S., United States Air Force Academy

MAJ. HAROLD J. WALTER, *Freshman Coach* — B.S., Springfield College; M.S., Indiana University



## HOCKEY

VICTOR HEYLIGER, *Varsity Coach* — B.A., University of Michigan

## GOLF

MAJ. WARREN L. SIMMONS, *Varsity Coach* — B.S., Syracuse University; M.S., California Institute of Technology

*Other intercollegiate sports are coached by Physical Education Instructors as noted.*

Intercollegiate athletics provide a source of competition for a large number of cadets to compete in individual or team sports against colleges and universities.

A total of 18 intercollegiate sports are available to the cadets:

*Fall* — football, cross-country, soccer

*Winter* — basketball, fencing, gymnastics, swimming, skiing, wrestling, rifle, pistol, ice hockey, indoor track

*Spring* — baseball, golf, tennis, track, lacrosse

The Academy's varsity teams are known as the Falcons. The teams compete with leading colleges and universities from all parts of the nation. The following 1968 football schedule is an example of the intersectional competition scheduled in all sports:

HOME GAMES	AWAY GAMES
28 Sept Wyoming	21 Sept Florida (Tampa)
2 Nov North Carolina	5 Oct Stanford (Palo Alto)
9 Nov Arizona	12 Oct Navy (Chicago)
16 Nov Tulsa	19 Oct CSU (Fort Collins)
	26 Oct Pittsburgh (Pittsburgh)
	23 Nov Colorado (Boulder)

All home games are played in the 40,000 seat stadium located on the site of the Air Force Academy. The Air Force Academy Foundation, an organization of national civic leaders, raised funds to construct the stadium.

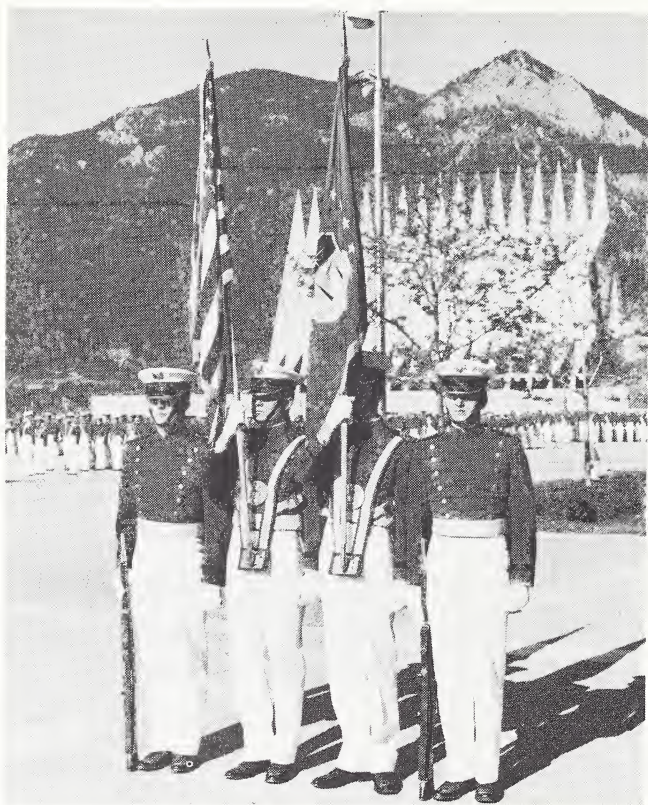
Other competitive sports are conducted in the Cadet Gymnasium and on surrounding athletic courts and fields. A Field House is being completed as part of the expansion program to accommodate a larger Cadet Wing. It contains facilities for athletic practice during inclement weather, a basketball game facility, an indoor competitive track facility, and an ice hockey area which can also be used for skating and indoor tennis.

All intercollegiate athletics are financed by the Air Force Academy Athletic Association, a self-supporting and non-profit organization composed primarily of Air Force personnel. The Association provides experienced coaching staffs and athletic equipment and maintains a central office at the Academy to handle the administrative details of intercollegiate athletics.

# The Cadet Honor Code

"We will not lie, steal, or cheat,

nor tolerate among us anyone who does."



These simple words provide the basis for a personal code of ethics designed to serve the Academy graduate throughout a lifetime of service to his country. Each candidate for appointment must be prepared to accept this Honor Code. A person who cannot accept it should not apply for admission to the Academy.

The Honor Code is specific and clear in what it demands. A cadet is expected to have complete integrity in both word and deed; he avoids quibbling or evasive statements; he does his own work in class. The Code belongs to the cadets. Maintaining its high standards of trustworthiness is the responsibility of each man.

A cadet is expected to report himself for any Honor Code violation. He is also expected to confront any other cadet whom he believes has violated the Code, and to assure the incident is reported. The Honor Code — by stressing that there can be no toleration of lying, cheating, or stealing — emphasizes that honor is a community possession of the Cadet Wing. Those who belong to the Wing must accept this fact wholeheartedly.

When he embraces this Code, the cadet is not setting an impossible standard for himself. The precepts of the Code are fundamental to the American scene, but the high standard of adherence demanded by the Cadet Wing does require self control and conscious effort for most new cadets. Later this becomes an ingrained habit and part of the cadet's total ethical code.

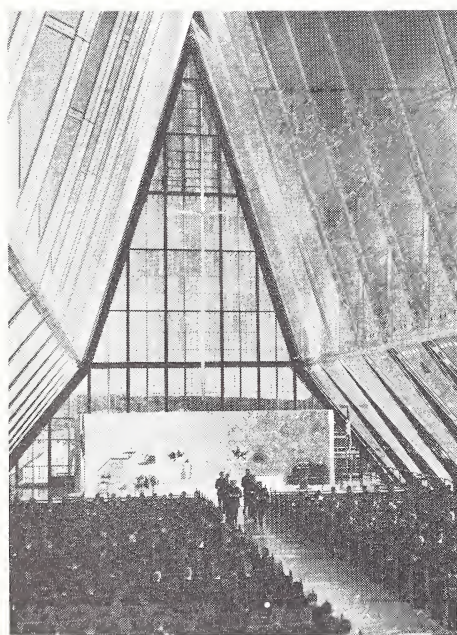
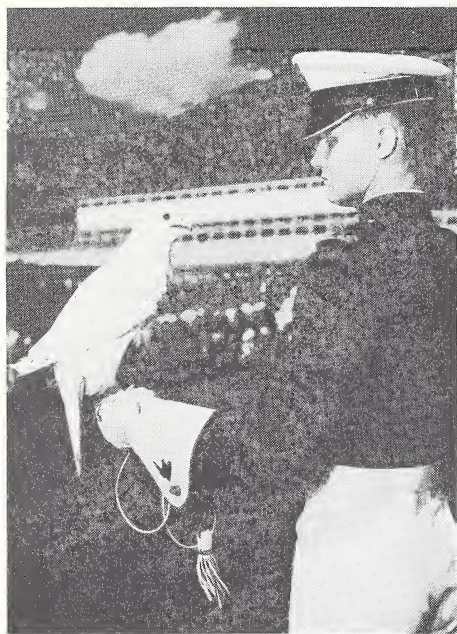
The well meaning young man has nothing to fear when he joins the Cadet Wing and accepts the Honor Code. Immediately after entering the Academy, he receives an indoctrination in the cadet way of life during a 7½-week Basic Cadet Training Program. During that period he receives instruction in the application of the Code from elected Cadet Honor Representatives of the First Class. Honor Code instruction is given in an informal atmosphere where the basic cadets are encouraged to ask questions and resolve any problems of interpretation that may arise. The summer training culminates with acceptance of cadets into the Wing as Fourth Classmen with complete responsibility to the Honor Code. Periodic reviews of the Code and its implications are conducted throughout the year for the benefit of all cadets.

The Honor Code is a tool for self discipline by the cadets themselves. It is not used as a regulatory device by the Academy administration. Although the Code demands unqualified adherence, it does not place cadets on their honor to obey all orders and regulations or to report all infractions. The Code is a basic moral document covering only substantial matters of morality. By its very wording, it sets its own boundaries.

Cadets regard the Code as only a minimum standard. In practice it is the foundation for a larger ethical code which serves the Cadet Wing both as cadets and as future officers. Academy graduates regard the experience of living under the Honor Code as a cherished possession. To them, the ingrained habits of integrity associated with Academy graduates are a source of pride and a quality which helps them cope with the complex problems that face a career officer in the Air Force. Considering such an objective, the Cadet Honor Code is indeed one of the most important facets of life at the Air Force Academy.



# Cadet Life



## **The Cadet Way of Life**

The cadet way of life makes the Air Force Academy different from a civilian college or university. The cadet must maintain a rigid daily schedule, conform to strict discipline, and develop qualities of leadership and dedication to service in the Air Force. In addition to his regular class work, the cadet is continually being trained for his future as a career officer and leader. He develops character through the Cadet Honor Code, religious services, and applications of self-discipline. He practices leadership through the Cadet Wing organization, the military instruction of new cadets, and participation in competitive athletics. He applies his leadership training during field encampment exercises at the Academy and through special training conducted at military installations. He witnesses leadership in action on field trips to combat and support commands of the Air Force.

## **Basic Cadet Training**

A cadet is indoctrinated into his new way of life through a 7½-week Basic Cadet Training Program immediately after entering the Academy late in June. The objective is to prepare him to enter the Cadet Wing fully qualified in basic military skills, physically fit for athletic participation, and mentally conditioned with a sense of honor and duty toward his academic studies.

He is introduced to many areas which will be important to him during his four years at the Academy and his subsequent service as an Air Force officer. During this period the young man receives instruction in basic military subjects such as drill, manual of arms, weapons, discipline, honor, ethics and Air Force heritage. He undergoes physiological indoctrination, receives training in an altitude chamber, and takes an orientation flight in a jet aircraft. Throughout this training the basic cadet receives strenuous physical conditioning which includes regular exercises and obstacle course runs. During the program he participates in two weeks of field training where he learns basic military skills including field sanitation, map reading, patrolling, camouflage and concealment, and individual combat techniques. The basic cadet spends an additional week in the Pike National Forest where he learns basic survival techniques.

The Basic Cadet Training Program keeps the cadets busy from reveille to taps (6:10 a.m. until 10:45 p.m.). This fast, disciplined pace is a difficult transition for many of the cadets who have been accustomed to a relaxed life. The pressures involved in



the program teach the cadet discipline and self-control as well as test his ability to perform effectively under stress.

Those who complete the program are accepted into the Cadet Wing as full-fledged cadets during the third week in August which concludes the summer term. Although the extreme pressure of their military training is relaxed during the academic semesters, the rest of the Fourth Class year is far from being easy. Throughout this first year at the Academy, the cadets are subject to strict discipline and high standards of military bearing.

### **Summer Training**

During a cadet's ensuing three years at the Academy, his summer schedule is filled with a variety of leadership and military training activities. Academic classes are suspended during the summer term while cadets participate in training programs both at the Academy and at other military installations.

Third Class cadets undergo two weeks of field training in air base defense and survival tactics in the mountainous terrain near the Academy. They spend an additional week in combat weapons training at Fort Carson, 25 miles south of the Academy. Their summer program is concluded with a three-week field trip to combat and support commands of the Air Force.

The summer term for Second and First Classmen is diversified with several options available. Cadets participate in one or more of these programs: leadership practice through instructing in Basic Cadet and Third Class training, leadership experience in basic military training schools, duty with an Air Force unit, and special training conducted at Army, Navy and Air Force installations. Through these cooperative service programs cadets have an opportunity to take parachute training, underwater demolition and amphibious training, jungle operation training, and navigation and soaring training.

### **The Air Force Cadet Wing**

Life in the Air Force Cadet Wing provides an opportunity for personal development of leadership competence and recognition of outstanding performance. The organization of the Wing consists of a headquarters with a cadet commander and his staff and subordinate units of group, squadrons, flights and elements.

The groups and squadrons are supervised by commissioned officers designated as Air Officers Commanding (AOCs). They are individually selected to represent to the cadet the highest



standards of professional competence, experience, integrity, leadership, and career motivation. Under guidance from the AOCs, First Classmen are responsible for command and administration of organizations within the Wing. All First Classmen are cadet officers. The senior officer is the Wing Commander with the rank of cadet colonel. The group and squadron commanders are lieutenant colonels. Cadet majors act as executive officers. Captains are administrative officers, flight commanders and training officers. Lieutenants hold various duties within the squadrons.

Many Second Class cadets hold noncommissioned officer rank down through technical sergeant. They serve as flight and element sergeants and on staffs within the Wing to gain experience for leadership positions they will hold the following year. A few Third Class cadets hold the rank of staff sergeant. Positions and ranks are rotated among the cadets periodically during the year to enable a large number of cadets to gain experience in various leadership responsibilities.

Fourth Classmen do not hold rank and begin their leadership practice in the chain of command by strictly being followers. The assumption of leadership training is that the cadet must learn to follow before he can understand and assume the duties of command.

In addition to functioning as a leadership laboratory, the Cadet Wing fosters pride and excellence through competition between the groups and squadrons. The cadet organizations compete in a variety of intramural athletics and in military parades and reviews. Individual inspection of the cadet's appearance and his room also promotes a sense of personal responsibility and esteem.

## **Flying Programs**

Cadets are introduced to flying through various programs conducted during their four years at the Academy. The indoctrination begins in basic cadet training with orientation flights given by instructors in T-33 jet aircraft. In their Third Class summer, cadets are given orientation rides in some of the latest jet aircraft during their field trip to combat commands of the Air Force. In their Second Class year, cadets take several T-33 flights with instructors and receive associated ground school training.

Cadets who are physically qualified to fly may volunteer for Air Force pilot training when they enter their First Class year. These cadets receive a 36½-hour flying program before grad-

uation. The training is conducted in T-41 single engine aircraft based at Peterson Field near Colorado Springs. A squadron of Air Training Command officers with instructor ratings teach the cadets to fly the T-41, the primary trainer for Air Force pilots. Cadets who complete the program enter pilot training at Air Training Command bases following graduation.

The pre-graduation flying program is being offered at the Academy for the first time in 1968. It is designed to motivate a high percentage of physically qualified cadets for pilot training and to prepare them to achieve rapid proficiency in pilot schools.

Cadets may fulfill the requirements for private pilot or glider certificates through elective courses offered at the Academy. Instruction is conducted by Air Force pilots in light planes and gliders. FAA aeronautical ratings are awarded to cadets who complete the dual instruction, ground school and solo requirements. Elective courses in parachuting and navigation are also offered. Cadets who wish to become navigators may enter navigation training following graduation.

### **The Cadet's Day**

During the summer term cadets maintain a schedule according to the particular activity in which they are participating. Basic cadets are not permitted to entertain guests at the Academy nor leave the base on weekends until the completion of their summer training. The first time that cadets may entertain their parents and friends is during the Labor Day weekend following the conclusion of Basic Cadet Training. At that time the Academy holds a "Parents' Weekend" and invites the parents of new Fourth Classmen to attend special activities and visit their sons.

During the academic year (late August until June), the cadet's day begins at 6:15 a.m. with reveille. Cadets live in a cadet dormitory, two or three to a room. Each cadet prepares his portion of the room for morning inspection and then has breakfast in the cadet dining hall. Cadets attend classes or have study periods from 7:20 to 11:20. At 11:30 the Cadet Wing forms in front of the dormitory and marches to the dining hall for lunch. Cadets have classes or study periods from 12:20 to 3:20.

Unless the cadet is participating in intercollegiate athletics, he plays on a squadron intramural team two afternoons a week after classes. The other three afternoons during the week he spends in drill, extracurricular activities, or study. He may volunteer for additional academic instruction during the hour prior to dinner.



Dinner is from 6:30 to 7:00. At 7:15 the lower-class cadets must be in their rooms or at the library for study until 10:30 on week nights and Sunday nights. All First Classmen and those Second Classmen on the Superintendent's Merit List are not required to maintain a strict evening study schedule, although they are required to remain at the Academy on week nights. Taps is at 10:45.

Military training, Cadet Wing parades and inspections are held on Saturday mornings. Following the noon meal on Saturday, the cadet is free from duty. On Saturday afternoons and evenings and on Sunday afternoons, he may entertain guests in the cadet social center or leave the Academy on a pass if entitled to do so.

### **Leaves and Special Privileges**

Cadets of the upper three classes are granted leave during the summers, either before or following their field trips and other duties. The leave varies from two to four weeks depending upon the schedule for their class. Cadets have approximately two weeks of leave during the Christmas holidays, four days during Thanksgiving, and one week during the spring. They are free from duty on approximately seven national holidays during the year. Emergency leave may be granted to a cadet whose emergency involves a member of his immediate family. Other requests for special leave are considered on an individual basis.



Special privileges to leave the Academy on weekends are based on a gradual transition from the status of a basic cadet to a second lieutenant. Privileges are progressively increased by class in recognition of added maturity and responsibility. Cadets of the Fourth Class are very restricted in their privileges, while First Classmen are relatively free on weekends.

Second, Third, and Fourth Class Cadets are not permitted to own automobiles nor to maintain them at the Academy. This privilege may be granted to cadets during their First Class year.

### **Cadet Uniforms**

Distinctive cadet uniforms are issued to cadets during the fall of their Fourth Class year. The basic uniform in the wardrobe is the blue winter dress uniform worn during the academic year. The two parade dress uniforms (blue jacket and blue trousers for winter, and blue jacket and white trousers for summer) are worn to parades and ceremonies. The mess dress uniform is worn to social functions.

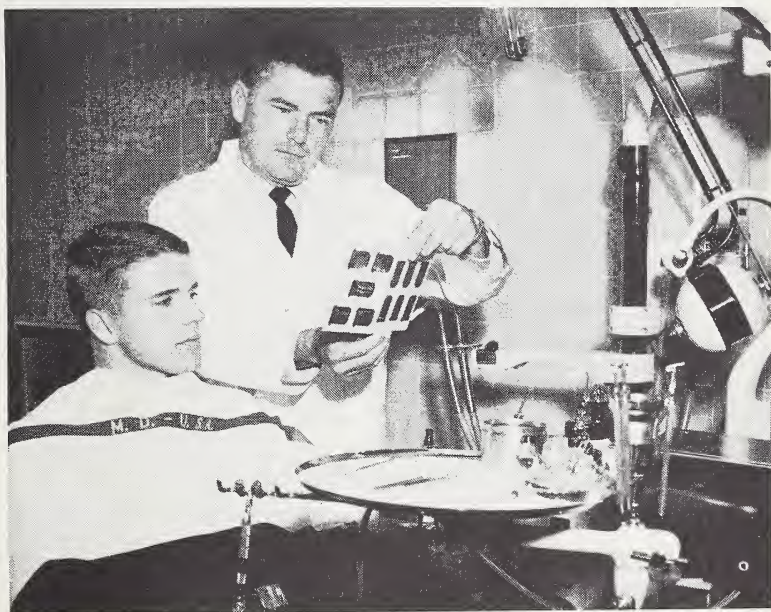
Cadets of the upper three classes may wear civilian clothes when departing on leave or weekend pass, while on leave or pass, and when returning to the Academy. Cadets of the First and Second classes may wear civilian clothes off base while off duty. Third Classmen have the same privilege during the spring semester. Cadets do not have occasion to wear civilian clothes during their Fourth Class year except while on Christmas leave.

### **Pay and Allowances**

The cost of a cadet's attendance at the Air Force Academy is borne entirely by the government. A cadet is prohibited from accepting any other grant or scholarship aid. The cadet receives \$160.50 per month which is credited to his account to pay for supplies, clothing, and personal expenses. Quarters, food and medical care are provided. A cadet's pay and allowances are considered sufficient for him to be self-supporting, provided he is economical. The pay is not sufficient for a cadet to cover any debts contracted prior to entrance, to send money home to his parents, or to spend for luxury entertainment or expensive personal items. The money is carefully allocated monthly to cover the cadet's obligations with only a minimum remaining for personal use. With proper economy during his four years at the Academy, a cadet can save enough to purchase the uniforms he will need as an officer upon graduation.

## Insurance

Government sponsored insurance is not provided for cadets. A special commercial insurance plan is available to all cadets on a voluntary basis. The plan provides \$20,000 term life insurance and is available for \$3.50 per month. This amount is set aside in the cadet budget from the cadet's monthly pay. The policy is free of conditions or restrictions as to occupation, residence, travel or military service. The policy is convertible to any permanent plan of insurance offered by the company at the end of the term period or upon graduation from the Academy. The plan does not prevent a cadet from purchasing insurance from any other company he may select.



## Medical Services

The Air Force Academy has excellent medical facilities located conveniently to the cadets. A cadet dispensary in Fairchild Hall provides out-patient treatments and physical examinations. A cadet dental clinic in the new dormitory provides complete dental care including orthodontia. The clinic, staffed by military dentists, is fully accredited by the American Dental Association.

Serving cadets and Academy military personnel and their dependents is the Academy Hospital located about two miles from the cadet area. This modern facility is fully accredited by the Joint

Commission on Accreditation of Hospitals and is a member of the American Hospital Association. Included on the medical staff are specialists in surgery, anesthesiology, orthopedics, eye, ear, nose and throat, internal medicine, allergy, pathology, radiology, optometry, psychiatry and flight medicine. Also supporting these physicians are highly qualified military and civilian personnel especially trained in advanced techniques related to the fields of pharmacy, physical therapy, medical laboratory, x-ray, nursing services and hospital administration.

If a cadet must be hospitalized his academic studies may continue through a special liaison program between the hospital and the faculty staff. The cadet, if medically able, receives special assistance by an instructor of a respective subject either at the bedside or in a special classroom available in the hospital ward. The program also includes tapes, books and any other materials needed to maintain academic proficiency.

### **Cadet Counseling Service**

A Cadet Counseling Service is available to each cadet at the Academy. The aims of this service are to assist the cadet in gaining the maximum in personal satisfaction from Academy life, in attaining the highest degree of academic success from his course of study, and in making an adequate career choice within the Air Force. The fulfillment of these aims is largely dependent upon the cadet's ability to adjust to the Academy environment both personally and academically. The Counseling Service aids in this adjustment through attempting to develop in the cadet the proper attitudes and motives and to identify his best aptitudes and abilities, relating these to the Academy program and an Air Force career.

The counseling office is open to cadets during all academic class days. A large collection of career information materials is maintained in the reading room to assist cadets with their career choices and professional success. A cadet counselor is available during all academic class days to advise cadets who request personal assistance.

### **Cadet Dormitory Facilities**

The cadet dormitories contain many facilities for the convenience of all cadets. The largest of these is a cadet store which stocks a variety of clothing and personal items, academic supplies, electronics equipment and records, sporting equipment, gift items, and snacks. The dormitories have laundry and dry





cleaning facilities, a post office and room for wrapping packages, a shoe repair shop, tailor shop, and barber shop. Also included in the dormitories are squadron recreation rooms, where the cadets can watch television and play cards and other games during off-duty hours, and cadet activities rooms where the cadet hobby clubs, committees and professional groups meet regularly.

### **Religious Program**

The Academy stresses the development of moral values through religious training. A military leader is responsible for upholding those values among the men within his command. A well-balanced religious program for the three major faiths — Protestant, Catholic and Jewish — enables cadets to develop their potential for religious leadership and at the same time to worship in the faith of their choice.

Attendance at an established church service is mandatory for all cadets except First Classmen. Second Class cadets may attend services in the Cadet Chapel or in a church of their own denomination in Colorado Springs if they prefer. Cadets of the lower two classes must attend Cadet Chapel services, and they may attend local churches following chapel if they desire.

Other religious activities available to cadets who wish to participate are daily morning worship, special denominational services, choir participation, Bible classes, retreats, and religious

discussion groups. Cadets may volunteer to teach Sunday School classes for children of Academy personnel.

Religious services are conducted by Protestant, Catholic and Jewish Chaplains who are ordained Air Force officers. In addition to their organized religious activities, the chaplains are available to cadets for private consultations at any time. Cadets may obtain advice and assistance from their chaplains to help them make personal adjustments and resolve specific problems.

The Cadet Chapel is the center of religious activities for the Cadet Wing. The unique Chapel features 17 aluminum spires, towering 150 feet in a space-age effect. The Chapel was designed to provide a separate area for the three major faiths and to impart a distinct character symbolic of each religion. The Protestant Chapel is enclosed by the aluminum spires which are separated by multicolored stained glass. On the terrace below are the Catholic Chapel and the Jewish Chapel. Also there is a Meeting Room provided for cadets who do not desire to worship in any of the three chapels.

### **Social Functions and Entertainment**

Arnold Hall is the center of cadet social functions. The social center is divided into three main areas: a theater, a ballroom, and recreation rooms. The 3,000-seat theater is used for movies, concerts, plays, guest appearances, and special events. Formal and informal cadet dances, receptions, and other social events are held in the large ballroom area. The recreation area has rooms for games, cards, television, a bowling alley, and snack bar.

Social functions are held in Arnold Hall on Friday and Saturday nights and evenings preceding holidays. The Cadet Wing Hostess supervises all of the functions. She also supervises the teaching of proper social customs and courtesies to Fourth Class cadets. This includes dining etiquette, social calls, introductions, grooming and conduct in public, and other social graces.

In addition to Arnold Hall, the cadets may use other recreational facilities at the Academy. These include the cadet gymnasium, golf course, riding stables, skeet range, automotive hobby shop, and picnic areas.

On weekends cadets and their guests may utilize the Academy recreation area, called Farish Memorial. Located in the mountains just west of the Academy, the area has facilities for fishing, horse-back riding, boating, barbecues, picnics, and winter sports.

## Cadet Activities

Many extracurricular activities are available to the cadets to develop their professional interests, their creative talents and hobbies, and their leadership potentials. The cadets have originated and continued their own activities on a voluntary participation basis. Organized cadet activities are as follows:

### ACADEMIC, ATHLETIC AND PROFESSIONAL ACTIVITIES

*Aviation Club* — Provides an opportunity for cadets to obtain FAA ratings through flight instruction.

*Bluebards (Dramatics Society)* — Theatrical participation in two major dramatic productions annually.

*Cadet Chorale* — Participation in group singing with appearances before the Cadet Wing and the public on special occasions.

*Engineering Society* — Extracurricular engineering projects in the areas of aeronautical sciences and rocket development, civil engineering, and electrical engineering.

*Falconers* — Cadets interested in falconry train and care for the Academy mascots and conduct demonstrations at athletic events.

*Forensic Association* — Participation in intercollegiate forensic competition (debating, extemporaneous speech, oratory, discussion, and interpretive reading).

*Forum* — Forum discussion with guest speakers and participation in intercollegiate student conferences.

*History Club* — Research in history including field trips.

*Mathematics Club* — Research in mathematics.

*Mechanics Club* — Research in mechanics.

*Physics Club* — Research in physics.

*Professional Studies Group* — Fosters professionalism and career motivation through movies and lectures by distinguished military and civilian leaders, cadet squadron airpower rooms, field trips to local military installations, a professional library for research, and a monthly publication, "Aerospace Newsletter."

*Representative Athletics and Military Clubs* — These cadet non-varsity teams represent the Academy in competition with regional or national teams: bowling, ice hockey, handball, large bore rifle, judo, skeet, soaring, squash, parachute, and water polo.

### PUBLICATIONS

*Contrails Staff* — Responsible for publication of the "Contrails" handbook which serves as a record for the traditions and customs of the Cadet Wing as well as an orientation guide to the military service for each class.

*Dodo Staff* — Responsible for writing an informal cadet paper called "The Dodo."

*Polaris Staff* — Responsible for publication of the annual Cadet Wing yearbook "Polaris."

*Talon Staff* — Responsible for publication of the monthly cadet magazine "The Talon."



## COMMITTEES AND COUNCILS

The following committees and councils are designated to present the interests of the Cadet Wing:

*Class Councils* — Class representatives study special problems, as directed by the Commandant of Cadets or the Cadet Wing Commander, and prepare supporting studies and reports.

*Class Ring Committee* — Representatives of the Second Class select the ring crest and assist the class in selection and purchase of the class ring. The ring is awarded during June Week of the Second Class year.

*Public Relations Committee* — Promotes a closer relationship between the local communities and the Air Force Academy through the Cadet Speaker Program.

*Wing Allied Arts Committee* — Helps select the entertainment and cultural programs presented to the Cadet Wing.

*Wing Dance Committee* — Representatives from each squadron plan dances for their class and the Cadet Wing.

*Wing Entertainment Committee* — Cadet Wing representatives advise the Allied Arts Advisory Board of stage performances desired by the Wing.

*Wing Rally Committee* — Representatives from each squadron plan pep rallies and halftime events at football games and other competitive sports.

## RECREATIONAL ACTIVITIES

*Art Club* — Provides cadets the opportunity to learn and participate in the fine arts.

*Autosports Club* — Stresses auto driving safety and participates in Gymkhanas in the local area.

*Biology Club* — Research in the biological sciences.

*Bridge Club* — Instruction in bridge and participation in local tournaments.

*Bowman Club* — Instruction in archery and participation in competition.

*Chemistry Club* — Research in chemistry.

*Chess Club* — Instruction in chess and participation in local tournaments.

*Fishing Club* — Fishing trips in the local area.

*Gavel Club* — Provides the opportunity to gain confidence and experience in public speaking.

*German Club* — Cadets further their ability to converse in the German language and study the history and culture of the German people.

*Gun Club* — Participation in hunting, hand loading and target shooting.

*Model Engineering Club* — Design, construction and operation of aircraft models, slot cars, railroads and ships.

*Mountaineering Club* — Mountain climbing activities.

*Music Club* — Furthers musical talents and provides music for certain cadet functions.

*Photography Club* — Instruction in photography and photographic assistance to activities of the Cadet Wing.

*Psychology Club* — Cadets attend lectures, films and demonstrations in the field of psychology.

*Radio and Electronics Club* — Furthers amateur radio interest and knowledge of military communications.

*Saddle Club* — Provides facilities and opportunities for horseback riding.

*Scuba Club* — Instruction and participation in scuba diving.

*Ski Club* — Instruction in skiing and trips to ski areas in the Rocky Mountain region.

*Spanish Club* — Cadets further their ability to converse in the Spanish language and study the history and culture of Spanish speaking peoples.

*Water Skiing Club* — Instruction and participation in water skiing and boating.



### **The Cadet Wing Mascot**

The falcon is the mascot of the Cadet Wing. The Class of 1959, the Academy's first class of cadets, selected the falcon mascot and named it "Mach I," the term indicating the speed of sound. The falcon was chosen because its strength, alertness, aggressiveness, and poise in flight are symbolic of the mission of the United States Air Force.

Several falcons are housed in mews north of the academic area of the Academy. The birds are trained and cared for by the Cadet Wing Falconers. These cadets train the falcons to fly in pursuit of a lure in the tradition of the ancient sport of falconry.

They conduct demonstrations of the falcons' flying ability at half-time activities at football games and other sports events.

### **Academic Activities**

The Academy sponsors several important educational meetings annually. Each spring an Air Force Academy Assembly is held with delegates from colleges and universities all over the country gathering to hear distinguished speakers and to discuss vital international issues. The annual Air Force Academy National Invitational Debate Tournament, sponsored by the Cadet Forensic Association, is held in December. Outstanding college debaters from throughout the nation compete for honors and trophies in this tournament. Important meetings are held frequently at the Academy by various scientific and scholarly organizations.

The annual Service Academies Exchange Program enables students at the four national service academies to visit and compare their training and curricula. Approximately 300 Air Force cadets visit one of the other service academies on designated weekends, and a similar number of students from the other academies are hosted by the Air Force Academy. On various occasions the Academy receives students from foreign service academies to participate with cadets in classrooms and on the athletic fields.

### **June Week Activities**

During the week prior to graduation of a cadet class, the Academy holds June Week activities honoring the graduates with parades, awards, and social events. June Week is climaxed by graduation ceremonies featuring a distinguished guest speaker, followed by the presentations of diplomas and commissions to the graduates. Parents and friends of the graduating cadets are encouraged to visit and take part in the June Week activities.

A program of cadet awards provides recognition to individual graduates who have attained outstanding achievement in academics, leadership and athletics. Some 51 individual awards and 13 athletic awards are presented to cadets during each June Week. Private individuals and organizations provide gifts for the outstanding cadets not to exceed a monetary value of \$200. Organizational trophies are presented to the most outstanding cadet squadrons in the following areas: academic achievement, military proficiency, intercollegiate athletics, intramural athletics, and military performance in drill. A trophy is presented to the most outstanding cadet squadron for achievement in all areas of unit endeavor.



# Career Information



## Officer Rank

A cadet who successfully completes the Academy curriculum will graduate with a commission as a second lieutenant in the Regular component of the United States Air Force. Under the agreement which he signed upon entering the Academy, the graduate has an obligation to serve as an officer in the Regular Air Force for five years. An Academy graduate ordinarily is expected to remain in the Air Force for a 20 to 30-year career.

## Career Counseling

An extensive career information and counseling program is conducted to assist the cadet in making a reasonable choice of his initial assignment and in formulating tentative long-range plans for his career. Outstanding officers from major Air Force organizations, representing the broad range of Air Force skills, meet with cadets in panel sessions to discuss their career opportunities and challenges, flying and technical training, graduate education, and personal aspects of service life. At his request, individual counseling is provided for the cadet by his squadron Air Officer Commanding, the Cadet Counseling Office, and other professional sources among the Academy faculty and staff. The career discussions are particularly emphasized during the cadet's First Class year so that he will have factual, current information concerning the Regular Air Force which he will soon enter as a professional officer.

## **Career Assignments**

### **FLYING TRAINING**

A cadet who is medically qualified may volunteer to enter Air Force pilot training following graduation from the Academy. A T-41 flying indoctrination program is given at the Academy for all cadets who plan to take pilot training. The training includes approximately one year of flight instruction at an Air Training Command base. The graduate will receive specialized training either in fighter, bomber or troop carrier aircraft.

The greatest percentage of Academy graduates initially pursue a flying career. The graduate may broaden his career horizons through qualification in pilot or navigator skills. Holding an aeronautical rating will assure the graduate that he may qualify for the highest type of staff and command responsibilities which require a flying background.

After serving an initial assignment as a pilot or navigator in a combat operational unit, the Academy graduate with a flying rating may then assume duties in another career area. Subsequent assignments ordinarily will alternate between jobs related to his flying specialty and those pertaining to another career area.

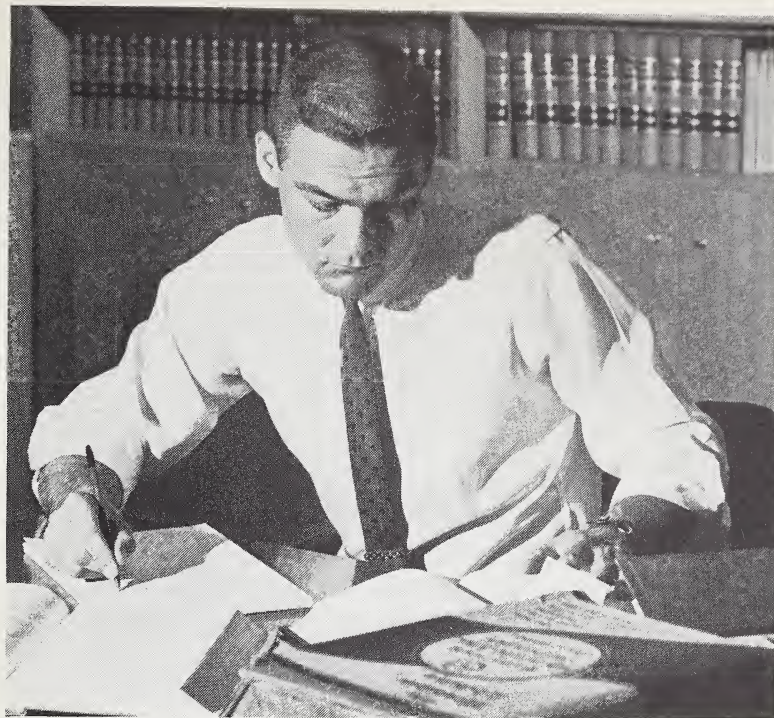
The Air Force offers a wide choice of career areas. Included in these areas are flying and operations, missiles, scientific and development engineering, electronics and maintenance engineering, civil engineering, transportation, communications, logistics, procurement, financial, statistical, personnel resources management, administrative, cartography, information, education and training, intelligence, and professional fields.

### **TECHNICAL TRAINING**

A graduate who is not medically qualified or does not desire flying training may indicate a choice for technical training after graduation to become qualified for a specific Air Force career area. He will receive a short period of training at an Air Force base in a support career area primarily related to his particular qualifications and his academic major at the Academy. His initial Air Force assignment will pertain to the technical training he received.

### **AFIT GRADUATE EDUCATION**

The Academy graduate who qualifies for advanced education may request a graduate school assignment. Graduate programs are administered through the Air Force Institute of Technology (AFIT) at affiliated civilian colleges and universities and also at the Resi-



Capt. David Roe, Class of 1962, Rhodes Scholar

dent School of Engineering at Wright-Patterson Air Force Base, Ohio. The AFIT program enables outstanding graduates to earn master's degrees in a variety of fields.

The Academy has made arrangements to offer cooperative graduate programs in certain subject areas in conjunction with selected colleges and universities. A cadet who demonstrates outstanding aptitude in his major field may be offered the opportunity to participate in one of these programs. He will complete certain graduate prerequisites at the Academy, and after graduation he will finish his master's degree requirements by the following spring at the civilian institution selected for his major.

Academy graduates who complete a cooperative graduate program may enter flying training following the school assignment if physically qualified. Other AFIT graduates usually are not given the opportunity to enter flying training after the completion of more lengthy graduate programs. These officers will be assigned within the Air Force to positions utilizing their educational specialties.

#### **GRADUATE SCHOLARSHIPS AND FELLOWSHIPS**

Academy cadets may compete for a number of distinguished graduate scholarships and fellowships. Included are the Rhodes



Scholarships for advanced study at Oxford University, National Science Foundation Fellowships, and similar selected national competitive scholarships. Academy graduates who receive advanced education through one of these awards may request flying training after completion of their graduate programs.

### **Career Benefits**

Advancement in the Air Force is somewhat similar to a civilian occupation. It depends upon length of service, qualifications, and performance. The pay scale is established by Congressional law. The officer is paid according to his rank and his length of service within the rank. An Academy graduate will ordinarily spend 18 months in the rank of second lieutenant before being promoted to first lieutenant. He will receive one periodic pay increase at the end of two years' service. He will ordinarily serve two years as a first lieutenant before promotion to captain.

As the officer progresses in rank, his advancement will be based increasingly upon his personal merit and initiative. The Air Force is a vastly technological and far-reaching organization, yet one that recognizes the value of the individual. The Air Force puts a high premium on leaders with vision, dedication and ability. It offers a stimulating challenge and an interesting future in a wide spectrum of fields to Academy graduates who employ their leadership talents.

Each Academy graduate usually will be assigned during his career to one or more of the armed forces schools for advanced professional studies. These include the Air Force schools at Maxwell Air Force Base, Alabama (Squadron Officers School, Command and Staff College, and Air War College) and the Department of Defense schools (Armed Forces Staff College, Industrial College of the Armed Forces, and National War College).

Graduates will have additional opportunities for advanced education. Career officers in the ranks of lieutenant through lieutenant colonel are eligible to apply for further education through AFIT at civilian colleges and universities. Selected officers attend on a full-time basis, receive full pay and allowances, have their tuition and fixed fees paid, and receive some reimbursement for books and thesis expenses.

The Academy graduate who becomes a pilot or navigator will receive flight pay in addition to his base pay. Base pay and flight pay are taxed by the federal government. All officers receive a tax-free allowance for subsistence and an allowance for living quarters when not occupying government housing.



Capt. Rich Mayo, Class of 1961, fighter pilot

During his career the Academy graduate can expect to have duty assignments both in the United States and overseas. He may take his wife and children overseas unless being assigned to a remote area where living facilities are not available for families. Each time he moves, the officer will obtain reimbursement for transportation costs, an extra allowance for the incidental expenses of moving, and free shipment of household goods. On an average, the Air Force officer will move to a new assignment every three to five years.

Additional benefits which the officer receives are: medical and hospital expenses for the entire family; commissary and base exchange privileges; officers club privileges; FHA mortgage loan insurance; group life insurance; 30 days' paid vacation annually. Monthly compensation is granted to dependents of deceased Air Force personnel who die in the line of duty while in the service.

One of the most attractive benefits is the military retirement plan. The government provides for retirement at no expense to the officer. He may retire at 20 years of service at 50% of base pay. Benefits increase proportionately to 75% of base pay at a maximum of 30 years of service. Officers contribute to Social Security and receive those benefits in addition to retirement.

A regular officer in the armed services has excellent security prospects with stable employment, pay and benefits. The Academy graduate automatically receives a Regular commission. Approximately half the officers in the Air Force hold Regular commissions. The remainder are Reserve officers on active duty.

### **Career Obligations**

A career in the United States Air Force entails certain obligations as well as benefits. An officer is expected to serve his country with serious purpose and dedication. He may be assigned to various areas of the world considered vital to the maintenance of national or international security or important to the scientific and technological advancement of mankind. Some of the areas may be underdeveloped or remote where living conditions are below standards to which the officer has been accustomed. Under all conditions the officer will be expected to give his best efforts and provide leadership for the men who serve under his command.

### **Association of Graduates**

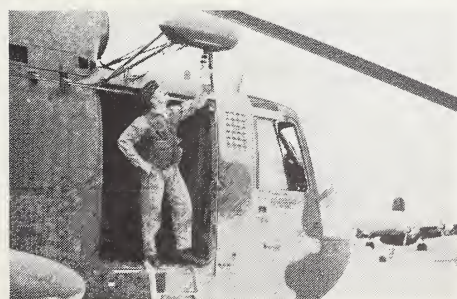
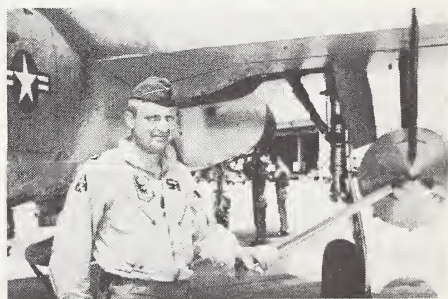
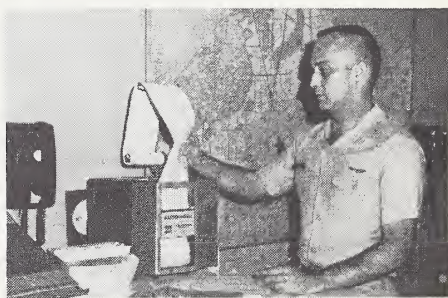
An Association of Graduates has been established at the Air Force Academy to maintain contact with the alumni. The purposes of the Association are as follows:

1. To promote interest in and devotion to the Air Force Academy, its history, activities, and objectives;
2. To encourage worthy young men to apply for appointment to the Air Force Academy;
3. To foster fellowship among the graduates of the Air Force Academy in particular and among the United States armed forces officer corps in general.

The Association of Graduates maintains an Alumni Secretary within the Command Section of the Academy to create a central point of contact for all alumni matters. The Association is organized as a non-profit body under the management of an elected Board of Directors, with necessary operating funds collected in the form of yearly dues as well as gifts, donations and bequests.

Through the Class of 1967, the Academy has graduated 3,457 cadets since its beginning in 1955. The graduates have been successful in many career fields of the Air Force. A number have distinguished themselves for courage and accomplishment in aerial combat. In 1967 five graduates were selected as "Outstanding Young Men of America." All are serving on active duty and have been outstanding in one or more fields of endeavor including flying, engineering and advanced education.





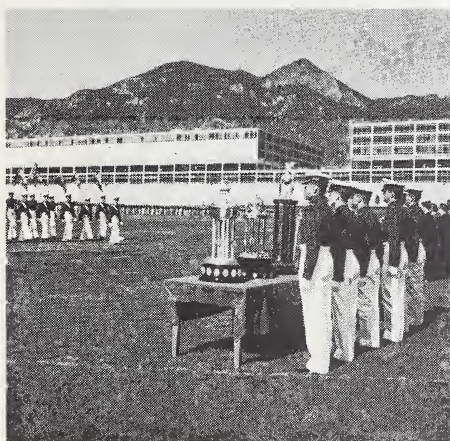
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*Counselors, prospective candidates or parents who have questions not answered by the information in this catalog may write to:*

REGISTRAR  
United States Air Force Academy  
Colorado 80840





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*"Bring me men to match my mountains  
Bring me men to match my plains  
Men with empires in their purpose  
And new eras in their brains."*

